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THE EVOLUTION AND DISTRIBUTION OF RACE, CULTURE, AND LANGUAGE

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[With separate maps, Pl. I, facing p. 116]

Introduction

In a recent paper¹ I attempted to show that the chief ethnological characters of man developed largely as a result of marked changes in climate during the Pleistocene age. I showed that the various races are distributed in zones about Central Asia. The most primitive races, the *original* Negritos, occupy or occupied the most distant or least attractive portions of the outer zone. Next come the Negro; and then is a zone including the Dravidian races, the aborigines of Australia, and probably the Botocudo of Brazil. Within in succession follow the Iberian, Aryan, and early Mongolian zones, even more fully represented in the New World than in the Old. Lastly are the late Mongolian peoples occupying the highlands of Tibet and the northwest of China.

It is the purpose of the present paper to show how these migrations from Central Asia occurred and to correlate with them the evolution of the culture of the folk composing them. The order of discussion is as follows:

1. The value of the cephalic index as a test of evolution. Upon this factor my zones are primarily based. I also make some suggestions which may help to explain the changes in color which have vexed ethnologists in all schemes of classification using this factor.

2. The changes in elevation and in coast line which have masked the old "corridors" used by man in his migrations. The position of the deserts has also varied considerably during the Pleistocene.

3. A series of maps which illustrate what I believe to be the stages in the populating of the world by the hundreds of diverse races recognized by the ethnologist.

4. The cultures of the varied people in each zone. It is shown that they agree in many important culture details—no matter how far they may be separated from each other.

5. The factors controlling the growth of a high civilization. It is shown that environment is a more important determinant than heredity. As the

¹ Griffith Taylor: Climatic Cycles and Evolution, *Geogr. Rev.*, Vol. 8, 1919, pp. 289-328. A full summary of this appeared in the *Melbourne Herald* dated August 26, 1919.

environment changes so does the civilization wax and wane, and so different races rise to eminence and then sink into oblivion.

6. Language, perhaps the most important single aspect of culture and the hardest to correlate. I hope to show, however, that each zone has its own common linguistic features, a recognition of which would be of great service to the philologist.

7. In an appendix the suggestions as to the causes of the controlling climatic cycles, which I made in my earlier paper, are modified in some degree, in accord with the research of G. H. Darwin and others.

Part I

The Cephalic Index and Other Criteria

There is a natural belief among most races that one's own people ranks highest of all nations. The Papuan despises the Negrito, the Taniel looks down on the Veddah, the Masai on the Bantu farmer, the "Dago" scorns the Semitic Arab. The Chinese with a culture dating back to 10,000 B. C., the Yucatan Mayas with an elaborate civilization in some respects higher than that of the British Isles at the same time, the Javanese and Cambodians are all dismissed as inferior races without any obvious ethnological reason save that they have not progressed so rapidly in the last 800 years as the white races of Europe. Since man has taken probably one million years to rise from an apelike ancestor, such a small space of time (equivalent to one day in three years) can have no bearing on race variation.

Of all the coefficients which have been used to classify man, the measurement of the shape of the cranium is still in my opinion the best *single* standard. Moreover, it is still one of the most generally determined and so offers greater facilities for comparison than any other. The most admirable demonstration of the value of the cephalic index in the study of the broader problems of anthropology has been made by Ripley in his masterly "Races of Europe."

In August, 1919, I published a chart based on the cephalic index (breadth expressed as a percentage of length) which led me to infer that the yellow type of man had developed from the Aryan type. My belief that the roundheaded cranium (Mongolian) is the later and higher type is corroborated by the results of many investigators, of whom Macalister and Venn may be cited.

Professor A. Macalister (1897) states that "the infantile and primitive skull is relatively long, and that there is a gradual change, phylogenetic (racial) as well as ontogenic (individual), towards brachycephaly."² Up to a certain limit this is certainly correlated with, and is apparently produced by, cerebral activity and growth. In the process of development in the individual and the race the frontal lobes of the brain grow more

² Quoted in A. H. Keane: *Man Past and Present*, rev. edit., Cambridge, 1920, p. 511.

rapidly and tend to fill out and broaden the skull. Professor Thompson has shown the same effect graphically by his model of the skull.³

Dr. Venn gives figures for Cambridge undergraduates showing that from 19 years to 23 years their cephalic indices increase from 77.9 to 79.2.⁴ Later on the frontal bones thicken, and this ontogenetic change is masked. Other writers, however, do not believe that this change to brachycephalism is uniform through life. As the various portions of the brain have very different functions and develop independently, we cannot expect simple or exact correlations. To some ethnologists the undoubted merging of races is a stumbling block. But the merging of colors in the solar spectrum does not invalidate the main phenomenon, i.e. the sequence of colors which is always constant.

In many features the Mongolian is at least on the same level as the white race. The Mongols of Central Asia and of the American Cordillera share with the Alpine (early Mongol) folk of central Europe the honor of possessing the highest cephalic index. They are of course furthest removed from the Negro and Negrito in this important respect. The same order obtains as regards orbital and aural indices and in the cross section of the hair. As regards cranial capacity the white and yellow races are ranked together by Duckworth, though Clapham states that the average weight of the Chinese brain is greater.⁵

Probably when sufficient data are collected we shall find that the evolution of man is epitomized in the children of the races. The recapitulatory theory would demand that the Mongol *child* should show criteria somewhat resembling those of the white *adult*. The white child again is more dolichocephalic than the adult and so resembles the Negro. The black child in some respects approximates to the apes.

COLOR

The control of the color of the skin by climate seems at first sight hardly warranted when we have such anomalies as the fair peoples of northern India and the dark Tasmanians and dark Eskimos in cold regions. But, if we take into account the migration belts and more particularly the *average* climate during the whole evolution of a race, the problem becomes less complex. Let us tabulate the main races with reference to head form, color, and temperature of the region now occupied.

The intensely black races are all dwellers in hot countries and are all very dolichocephalic. They all belong to the three earliest migration zones, i.e. Negrito, Negro, and Hamitic. With this class we may place the lower Melanesians, though they may contain some Aryan blood.

³ Quoted by W. L. H. Duckworth: *Morphology and Anthropology*, London, 1904, p. 262.

⁴ John Venn: *Cambridge Anthropometry*, *Journ. Anthropol. Inst.*, Vol. 18, 1889, pp. 140-154; reference on p. 152.

⁵ Crochley Clapham: *On the Brainweights of Some Chinese and Pelew Islanders*, *Journ. Anthropol. Inst.*, Vol. 7, 1878, pp. 89-94.

In almost every case these dark tribes have lived for untold ages in hot climates. They have never varied their climatic environment since their original development in the hot plains of southern Asia. The Australians

TABLE I—HEAD FORM, COLOR, AND TEMPERATURE
(Average regional temperatures in degrees Fahrenheit)

	COLOR	DOLICHOCEPHALIC	MESATICEPHALIC	BRACHYCEPHALIC
I	Coal Black	Guinea Blacks (78°)	Bishari (80°)	
	Sooty Black	Papuan (80°) Solomon Islanders (80°)	Dravidians (78°) Melanesians (80°)	
	Chocolate Brown	Australian (75°)	Some Hindus (78°)	
II	Copper Red	Niam-Niam (78°)	Algonquian (60°) Maropa (Bolivia) (60°)	
	Yellow Brown	Eskimo (20°)	Guarani (75°) Samoyede (20°) Malay (80°) Plateau Indians, U.S.A. (50°) Tehuelche (50°)	
	Olive Yellow		Polynesian (70°)	
III	Olive White		Italian and Levant (60°) Semites (70°) Japanese (50°)	
	Pale		Western European (50°)	Alpine (50°)
	Florid		Scandinavian (40°)	Finn (40°)
IV	Clear Yellow		Hottentot (60°) Brazilian Indians? (75°)	Chinese (50°) N. W. Amerind (40°)

The color data are chiefly from Paul Topinard: *Anthropology*, London, 1890, p. 344; and from W. L. H. Duckworth: *Morphology and Anthropology*, London, 1904, p. 353.

have always been much more numerous in the tropical portions of the continent. The Tasmanians have probably been in Tasmania for a few thousand years only, whereas they spent half a million years in the tropics.

There is a strong reddish tinge in the primitive negro skin which is very evident in the infant stage. This persists in some cases—as in the Niam-

Niam of central Africa. Is it not possible that the coppery color of the eastern Algonquian tribes is the same primitive color? The latter belong to the same Hamitic group as the southern Hindu—and have perhaps not yet had the color bleached out of them by their long sojourn in cool countries. The Maropa Indians of the Bolivian lowlands may owe their copper color to a similar cause.

In Group II the dark yellow or yellow-brown folk are all mesaticephalic and, except the Eskimos, dwell in warm countries. The Eskimo is, I believe, an extremely mixed type with a large amount of negroid blood, as his head form shows. Like the Negrito he occupies the least attractive portions of the earth and probably incorporates "débris" from all the ethnological groups. He has been bleached from the original red-brown color to a dirty yellow-brown. The Samoyede is of later (lighter-colored) ancestry; but he has lived for a shorter time in polar regions and so has arrived at about the same color as the Eskimo.

In Group III are the white races. They are of two types. (a) Bleached dolichocephalic brown folk who have moved into the cool damp borderlands of the Eurasian land mass from Africa. They include the Pelasgians in the south of Europe and probably many Nordics in northern Europe. (b) Bleached brachycephalic yellow folk from Central Asia like the Slavs, Finns, and Japanese, who also now live in the cooler moister portions of Eurasia.

In Group IV are the true Mongolians of eastern Asia and of the American Cordillera. They are usually very brachycephalic, showing their late evolution, and have only lately moved out from the desiccated regions of Central Asia. The Hottentots are Iberians (Hamites) who have dwelt in a similar environment. As regards the Brazilian Indians whom Gerland (Berghaus' *Physikalischer Atlas*) charts as clear yellow, every migration zone is represented in this huge territory—with great color variation as Whiffen shows clearly—and until further anatomical data are obtained it is impossible to classify these races. The reddish-yellow color of certain primitive forest tribes may be the original negro color slightly bleached by their life in the thick shadows. I have no doubt that many dolichocephalic tribes will be found in the depths of the selvas.

Summing up it will be found that the sequence yellow, white-olive-brown, dark brown (black) occurs in every direction around Tibet except perhaps in the little-known Brazilian region of South America. Even here the extinct Charrua of the southeast (Uruguay) were very dark.⁶ Thus the color evidence on the whole agrees very well with the migration zones based on anatomical criteria.

Orestes Arango: *Historia de los Charrúas*, Montevideo, 1911, p. 51.

Part II

Changes in Elevation

The great white civilizations of the day have grown up chiefly on the borders of the Atlantic Ocean. One result of this distribution is that until recently many geologists had perhaps too strong a belief in the permanence of continental morphology. In these regions near the North Sea and near the Alleghanies, though slight changes in the continental shelf have occurred

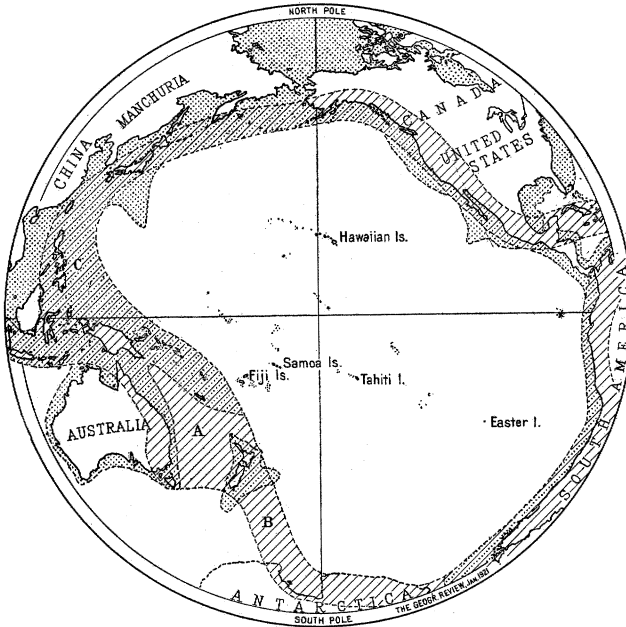


FIG. 1.—The most mobile region of the earth's crust. The chief fault and earthquake belt (mainly after Hobbs) is indicated by ruling; the areas covered by terrigenous deposits (after Murray) by stippling. Much of the region indicated, except about the areas marked A, B, and C, was dry land in early Pleistocene time.

in late geological times, there are no such stupendous bucklings as characterize the coasts of the Pacific or the "Alpine Storm" across the Old World.

In eastern Australia, also, crustal movements have occurred on a somewhat reduced scale, but certainly quite recently in geological time. The canyon of the Barron River in northern Queensland, the intricate network of the coastal drainage, the grand valleys of the Blue Mountains (perhaps the finest dissected monocline in the world), the ten great block faults and graben of the southeast are all of very late Tertiary age. There is little doubt that earth movements are still affecting us here, as elsewhere around the Pacific.⁷

⁷ See Griffith Taylor: The Australian Environment (Especially as Controlled by Rainfall), *Commonwealth of Australia Advisory Council of Science and Industry Memoir No. 1*, Melbourne, 1918; *idem*: Physiography of Eastern Australia, *Commonwealth Bur. of Meteorol. Bull. No. 8*, Melbourne, 1911.

The most mobile regions of the crust, those that have suffered the greatest movement in a vertical direction, are within the well-known earthquake belt. Pirrson and Schuchert definitely assign the volcanic outflows of the Pacific, which accompanied these movements, to the Pleistocene.

As a result of much evidence of this kind we must agree that the present age is one of rapid geological evolution. Especially in connection with the old land bridges and corridors connecting the large land masses is this concept of recent marginal change of paramount importance.

For instance, Hedley has shown that the Bass Straits have sunk so recently that much of the marine fauna at each end of the Straits has still not merged.⁸ This explains how the Tasmanians crossed over "dry-shod" from the mainland. Hedley is also collecting similar evidence with regard to a continent between the New Hebrides and Queensland. Much greater changes in the seas can be justifiably assumed where greater elevations occurred alongside.

It is highly probable that the Indo-Gangetic plain was a wide strait not far back in the Pleistocene. This would partly explain why the Negro race is absent in India and why the Dravidian race was here preserved so near the cradle of human evolution. In all other directions, where it was unprotected by waters or marshes, this race has been driven forth by higher cultures.

It seems reasonable to assume a large Malayan continent extending from Burma to Borneo. Moreover there is nowhere else in the world so complex a system of rivers as in the Burmo-Chinese marches. Such a physiography is indicative of recent topographic changes.

I have advanced arguments elsewhere showing that the Lake George rift in eastern Australia occurred only a comparatively few thousand years ago.⁹ The typical broken drainage lines of eastern Australia with rivers rising on the elevated coast line are reproduced all round the Pacific especially on the American side.

In Alaska we know of a rise of 47 feet as the result of one earthquake. The coastal scarp of California exhibits wave-cut terraces as high as 1,500 feet above sea level. Along the American coast from San Francisco to Chile the traveler has almost constantly in view these giant steps in which the mountains have been uplifted from the sea. In the central Andes Berry has shown that since late Tertiary or Pleistocene times there have been differential vertical movements amounting to a minimum of 13,500 feet.¹⁰

The terrigenous deposits on the floor of the ocean lend striking confirmation to this hypothesis. It is of course recognized that modern rivers contribute much to these deposits, but wide belts are found in Bering Strait,

⁸ Charles Hedley: The Effect of the Bassian Isthmus Upon the Existing Marine Fauna: A Study in Ancient Geography, *Proc. Linnean Soc. of New South Wales*, Vol. 28, 1903, pp. 876-883; reference on p. 878.

⁹ Griffith Taylor: The Lake George Senkungsfeld, *Proc. Linnean Soc. of New South Wales*, Vol. 32, 1907, pp. 325-345.

¹⁰ E. W. Berry: The Age of the Bolivian Andes, *Proc. Natl. Acad. of Sci.*, Vol. 3, 1917, pp. 283-285; see also Isaiah Bowman: The Andes of Southern Peru, New York, 1916.

off Oregon, off the Gulf of California, and again on both sides of Patagonia and Argentina. The coasts of Siberia and especially of China are bordered for 700 miles by a belt of these deposits. The whole of the Malayan Seas is covered with them. They connect New Guinea to the New Hebrides, forming an area which agrees almost exactly with the Papuan ethnological region. Hence there is ground for the belief that the Pacific Ocean was smaller in the Pleistocene period, being reduced by a belt of land varying in width from 100 to 700 miles. Moreover, it is equally important to note that the rugged cordilleras which so handicap communications all round the Pacific were undoubtedly much lower and less dissected—and in all probability less folded—in mid-Pleistocene time.

In conclusion it may be stated that the uniformitarian theory of geological evolution, though true enough through most of the record, applies only in modified form to the Pliocene and Pleistocene epochs, for we are living in one of the most variable and stimulating periods of geological history. This is far from suggesting adherence to the old catastrophic theory, for even today all Nature's processes are processional rather than paroxysmal.

MOUNTAINS AND DESERTS

There are two types of deserts which concern us in the present study: the trade-wind desert, which lies along the tropics; and the rain-shadow desert, which is so striking a feature of Central Asia and to a lesser degree occurs in the western United States and Patagonia.

In my earlier paper I showed that the cooling of the temperate regions which marked the Pleistocene led to an equatorward movement of all the climatic belts, including the trade-wind deserts. There was a compensating improvement in higher latitudes, e.g. in the southern Mediterranean countries, in Persia and Mesopotamia, in Cape Colony, in Utah, and in southern Australia. This condition is now being reversed, and the laterites and other products of aridity formed in the Pleistocene desert lands near the equator are now being disintegrated and removed by the more frequent rains of today.¹¹ The rain-shadow deserts depend very largely on mountain barriers. This class of desert was of much less extent during the earlier history of man. It has been shown that the Himalayas, the Andes, and Rockies have probably added many cubits to their stature quite recently. Before this growth occurred the arid plains of Tibet were warm grass-covered steppes. The now desolate *punas* of Peru were fitted for human occupation. The Great Basin of the United States was filled with fresh water of which the Salt Lake is a very degenerate descendant.

The conditions in Egypt and northern Africa have deteriorated remarkably since the times of the ancient Pharaohs. It seems likely that the unspeakable Turk is by no means wholly to blame for the misery of the Oriental lands which he has dominated for centuries. The dry features

¹¹ H. I. Jensen, private note *re* Northern Australia.

here, however, are due to the swing of climatic belts rather than to the growth of mountain barriers.

Part III

Populating the World—the Major Stages

It is thus obvious that the factors controlling the evolution of the human races are complex, but not, I believe, undecipherable. *Heredity* certainly determines race, but largely because man's ethnology has been the result of age-long residence in the Asiatic cradle—where racial characters have slowly been developed. Even here it is the varying *environment* which has very slowly molded the race. But his status and place in the scale of civilization have been largely controlled by his *environment* after he has moved out into the world. Nothing is more striking than the slight factors which have apparently led to such mighty results. The original Fuegian moved to the northeast from Asia; the Goidel moved to the west. Yet one is now almost the most primitive of races; the other partly builds up the sturdy Scotch race playing a major part in the control of the activities of the world. Yet these races are ethnologically akin.

The chief stimulus determining the evolution of man has been the unique variation in the climate of the Asiatic land mass during late Tertiary time.

In my earlier paper I described briefly the reasons for my belief that the Negrito was the earliest form of man, and that he originated somewhere between Persia and Malaya. One important feature of the Negrito migration was the numerical inferiority of the tribes. They were never able to resist the advance of stronger peoples, so that tribes were often almost annihilated and the women distributed among the conquerors. The resulting children would conceivably form a despised race which would tend to join their dwarf fellows in the forests. Some evidence of a primitive dwarf Negrito race is found in all the continents, but nowhere is there a race which has not mixed with the neighboring tribes to some extent. Hence we find, as will be shown later, that the head form is much more varied than in any other of the major races of mankind. Undoubtedly the most primitive Negritos are found in the forests of central Africa and include the Akka and Batwa.

Negrito folk have been doubtfully described from Peru, southern Chile, and Venezuela in America.¹² There is no doubt that Bushmen formerly existed in northern Africa and in western Europe (i.e. some Aurignacian people).

THE FOLK IN THE GÜNZ ICE AGE

In Figure A, Pl. I, I have attempted to reconstruct the continents during the Günz Age.¹³ The date of the change from apes to man is usually placed

¹² On a possible pygmy race in Central America see S. P. Verner: The San Blas Indians of Panama, *Geogr. Rev.*, Vol. 10, 1920, pp. 23–30.

¹³ For a correlation of the stages of Penck and Brückner (*Die Alpen im Eiszeitalter*, Leipzig, 1909) see F. Leverett: Comparison of North American and European Glacial Deposits, *Zeitschr. für Gletscherkunde*, Vol. 4, 1909–1910, pp. 241–295; 320–342.

in the Pliocene. During the early Pleistocene I imagine that the Negrito type and probably the Neandertal type were both developing. The former probably gave rise to the various pygmy types and the latter perhaps to the Negro type.

We get no certain evidence of man in Europe until the later Ice Ages, but it is logical to assume that the primitive folk had evolved earlier in Asia; since we know that the later sequence of development was continuous in southern Asia.

In Günz times (which are dated at 800,000 B. C. for reasons given in my earlier paper)¹⁴ a large ice sheet covered the high latitudes, approximately as shown. The trade-wind desert belt moved nearer the equator. The Malayan and Persian lowlands were probably covered with forest into which the Negrito folk retreated. It is probable that the Gangetic strait was in existence, so that most of the Negritos moved to the southeast and southwest before the on-coming cold. Their descendants are still most numerous in these two quarters. This separation into two diverse *wings*, occurs throughout the migrations.

THE GÜNZ-MINDEL INTERGLACIAL

During the Günz-Mindel Interglacial the climate of Central Asia greatly improved. For some hundred thousand years the primitive types developed in the forests which has moved north again after the retreating cold. The tribes gradually spread and became accustomed to a cooler climate than that suiting their ancestors. Thus were evolved the true Negro peoples and later the Bantu.

TOWARDS THE CLOSE OF THE MINDEL ICE AGE

The Negro races moved to the south with the migration of the forests and of the fauna on which they preyed (see Fig. B, Pl. I). They drove the scattered Negritos before them. We find few true Negro people to the east of the center of dispersion, though some tribes of this migration are seen in the frizzy-haired, very dolichocephalic Papuans and Melanesians. Some traces also occur in the negroid Susians of southwestern Persia.¹⁵

This distribution leads me to suppose that the Deccan was inaccessible and the Malayan continent not so readily reached as the broad lands of Africa. Skulls both of Negritos and Negroes are known from Egypt. Steatopygy and hair on the body are indicated in models from early graves, and this also demonstrates that the Negritos and Bushmen passed through Egypt on their route south. Similar artifacts from southwestern Europe probably date a little later but give us accurate information as to some of the earliest peoples of Europe. The direct path to Europe was blocked by the Ural Gulf, and all our earliest ancestors moved into Europe from the

¹⁴ See also Appendix to this paper.

¹⁵ See W. Z. Ripley: *The Races of Europe*, New York, 1899.

south. However, the negroid folk for the most part would keep to the forested country, which lay then as now near the equatorial regions.

The Bantu, both in culture and ethnology, come between the Sudanese Negroes and the Hamitic peoples. We have not much evidence as to whether they developed from the Negro tribes who remained in Asia or whether they originated very much later in the park lands of the Sudan on the borders of the Negro tribes. Johnston inclines to the latter belief and thinks that their language shows Pelasgian affinities due to Hamitic traffic across the Sahara.

It may be well to dwell for a moment on the "Hybrid Theory" of race origins, and use the Bantu as an example. One school believes that the Bantu is a cross between the Negro and the Hamite. They do not in general explain how the Negro reached Equatorial Africa nor how the Hamite occupied northern Africa; but, assuming these facts as inexplicable, they state that the Bantu is a merging of the two distinct races. This may be true, but to my mind it is more logical to assume that the stimuli which changed the ape man into the Negro continued to act and produced the Bantu and continued further and produced the Hamite. The results as regards distribution and as regards anatomy, culture, and language are not very different. Probably we shall never be able to say definitely where primitive "Asiatic" differentiation ceased to operate and the hybridization of adjacent tribes in their ultimate settlements began. Modern statistical methods combined with the graphic representation of racial characters will, however, go far towards the desired result. In the particular problem cited we may obtain evidence from the language and customs of the Susians. Are they primitive negroid or do they show Bantu affinities?

DURING THE MINDEL-RISS INTERGLACIAL

The climatic and competitive stimuli remained strongest in the center of the great Asiatic land mass. The cephalic index of the folk who fought the changing environment increased during this period from about 72 to 74 (see Fig. C, Pl. I). Thus was evolved the Mousterian. His most natural route for migration was obviously to the south and east, for we may assume that the Gangetic plain now rose out of the sea, and that the partial barrier to the Malay region (which may have been open water, very high mountains, or possibly unusually thick tropical jungles) was now removed. Many Mousterians moved to the west across the Red Sea into Africa, where they perhaps encountered the Bantu folk. At any rate we know they moved northwest along the Mediterranean coasts and entered Spain and France. Their skulls occur plentifully in these countries, typically at Moustier. Other hordes migrated into the Deccan pushing before them a few Negritos, who ultimately found refuge in the islands off India (Veddah in part, Andamanese, etc.).

It seems probable that nowhere was there any large population. All these

tribes lived by hunting, and it would be logical for them to be on the whole moving onward, so as to keep plenty of room between themselves and any succeeding tribes. They had all the world before them, and I doubt if any district became at all thickly populated till long after the last Ice Age.

THE RISS-WÜRM INTERGLACIAL

The Riss Ice Sheet advanced from northern centers about 400,000 B. C. and its associated marginal climatic conditions drove most of these folk away from the cradle of the race. On its retreat there ensued the long years of the next Interglacial period (see Fig. D, Pl. I). In southern Asia developed the Iberian race, which gradually expanded and drove the Mousterians away on all sides. Man had become accustomed to a cooler climate, so that we find the Mousterians fleeing to the northeast and ultimately reaching America *via* the Bering Corridor. I am, however, disposed to fix their entry into the unoccupied continent about the time of the last (Würm) Ice Age, about 100,000 years ago.

During this Interglacial period Mousterian man occupied western Europe and the Malayan region. The latter was much larger than it is today; but, since no true mammals ever reached Australia, it seems likely that there was always a wide break somewhere between Java and New Guinea.

Bean has shown that the aboriginal folk all through the Philippines belong to this Mousterian (Australoid) migration,¹⁶ possibly mixed with the Negrito.

THE WÜRM ICE AGE

As the last ice sheet advanced it drove forth the Aurignacian and Iberian peoples (see Fig. E, Pl. I). They spread fairly uniformly to the west, south, and east. They occupied the warm park lands especially in central India and around the Mediterranean. Large tribes must have moved to the northeast with the retreat of the Würm Ice Sheet, so that possibly there were more Iberians (including the earlier Aurignacians) in Manchuria and the vicinity than anywhere else.

At this date we may picture the scattered Mousterians spreading through North America and through Malaya into northern Australia. Probably they marched along the New Guinea tract, which was undoubtedly much broader and lower at this time. The trade-wind desert now occupied most of northern Australia. Probably New Caledonia was nearly joined to New Guinea, for the early Melanesian folk reached the former place presumably before navigation was of a high order. In a later section I discuss the possibility of some low-statured peoples (Aurignacians) forming part of this migration.

THE AZILIAN AGE

This was pre-eminently the age of great migrations (see Fig. F, Pl. I). The climate was becoming much warmer, and towards the close of this age

¹⁶ R. B. Bean: *The Racial Anatomy of the Philippine Islanders*, Philadelphia and London, 1910, p. 233.

(about 40,000 B. C.) there is no doubt that in general it was warmer than at present in temperate regions. The great feature of this period was the broad corridor extending from Siberia to North America. It was quite free from ice, and the southern border in summer was no doubt a pleasant land resembling Scotland. The absence of the Polar current which now chills eastern Siberia would also greatly contribute to this result.

Meanwhile the Aryan and Mongolian peoples were arising in Central Asia and spreading forth, pushing the Iberians ever outward. It is certain that the interior of Asia altered completely in character during early Neolithic times. The great mountains rising to the south gave an excessive rainfall to northeastern India but deprived the Tarim Basin and Tibet of the most vital factor in civilization.

Hence we find a resistless pressure outward on the part of all the folk of Asia. The greatest migrations occurred to the northeast, where the resistance was least. For, as the first Iberians reached America, they would find a glorious country improving in climate and food supply the farther they moved to the south. One can picture a "stampede" of peoples such as the world had never seen before and can never see again. Only a few helpless Mousterians would flit through the woods ahead of them.

MOVEMENTS IN AMERICA

The woodlands would offer a much more tempting corridor and a better food supply than the open prairies to the east. Hence we may picture the Iberians moving almost due south at any rate as far as Mexico before they curved round to the east.

It seems probable that the topography of Central America was very different in Azilian times. As Huntington has shown, the climate was better than it is now even within historic times. Probably the migration zones themselves offer the best argument in support of an easy land route between the two continents. We find a parallel distribution of peoples. In both the northern and southern continent the broad "main" corridor lay along the open uplands of the west, while the more primitive tribes were pressed to the east away from the main route.

THE IBERIANS IN EUROPE AND AFRICA

The Iberians occupied Egypt and almost the whole of Europe. They were a people with much architectural skill, the builders of the megalithic monuments. These monuments are found almost all over the world save where the lower races have held their ground. Thus we get them not only where Iberian folk still remain but also throughout central and eastern Asia and through Russia, where there are no Iberian peoples today. This fact seems to me to prove conclusively that the Megalithic folk were by no means a coast-loving people, moving eastward from North Africa to Poly-

nesia and America, as Elliott Smith suggests, but were one of the major migrations that spread *centrifugally* from Central Asia in all directions.

In Africa they followed the main corridor down the open park lands of the east; and their forerunners, the Hottentots, ultimately reached the extreme south. Here they were isolated by the huge numbers of Bantu who pressed across their track (from the northwest) at a much later date. The Hottentot in fact represents very closely what is called an "outlier" in geological language.

PLACE OF THE SEMITES

The Semites were probably the highest development of the Ibero-Hamitic migrations, rather than the lowest of the Aryan peoples. The merging of the Libyan Hamites into the Semites, and the much greater differences between Semitic and Aryan languages corroborate this. Moreover, in Melanesia we seem to get a closer relation between the Iberian and Semitic zones than with the later tribes of New Britain who are early Aryan, I believe (see also the lava-flow analogy, Fig. 9).

The Semites and Iberians are closely linked, the former being a late variety with many striking customs which they have carried all over the world. Hence has arisen the myth of the Lost Ten Tribes. The Jews proper are a small tribe who migrated from Palestine within the last two or three thousand years; but the allied Semitic migration reached America about 50,000 years ago, while various isolated tribes of the same type were probably first planted in portions of eastern Asia nearly 100,000 years ago. I shall deal with the evidence linking these pre-Aryan (Semitic) folk together in a later section.

Later the Aryan peoples also poured into America during early Neolithic times. Ethnology has not only developed very recently but also only among the white folk of western Europe, so that they naturally called their own kin the "Indo-Aryans." But 2,000 years ago an impartial ethnologist would probably have termed the western Europeans an unimportant offshoot of the great family of olive-white peoples with an index near 78, which moreover he might reasonably have named the "Indo-Amerind" family.

EARLY ALPINE FOLK IN EUROPE

It seems probable that the first Asiatics in Europe were Alpine folk who had short heads (83-85) and who moved along the central highlands towards the close of the Azilian period. They brought in a new culture not necessarily equal to that of the African longheads. As I explain later, it seems to me almost certain that they spoke a primitive Aryan tongue allied to the Galcha of the Pamirs. We find these folk in the mountain regions of France and Switzerland as the Cevenole and Ladin peoples. I expect that a similar primitive structure and vocabulary will be found to ally the Ladin, Romansh, Illyrian, Ossete, Armenian, and Galcha languages; but I can find little data on the subject (see below).

A few of these early Alpine folk reached Britain, where they built the round barrows. But this was much later (in the Bronze Age), and they made no permanent impression on our dolichocephalic race.

PREHISTORIC AGE AND LATER

The chief stimulus to change and migration of late years has been the desiccation of Central Asia. This is shown by the researches of Sven Hedin, Huntington, Sir Aurel Stein, and in fact by all who have traveled in Tibet, Mongolia, Turkestan, and Persia.

Many thousand years before Christ the Chinese started to move down from the Tarim Basin through the "Jade Gate" to occupy the upper basin of the Hwang Ho. To my mind they represent perhaps the latest development of the human race. The conquering Chinese of this early period were much more brachycephalic than the mixed race which now occupies the south and east of China. It is, however, this latter class which is best known to the foreigner, and they have usually been taken as of pure Chinese blood. But the invaders (with an index around 87) found China in the hands of Aryan and Iberian races, of whom many still survive in southern China. Some of these are the Miao-tse, Lolo, Hakka, Yao, Li, and Minchia tribes.

The Chinese set in motion the Tungus and allied people, who again found in the great corridor via the Bering region the line of least resistance. Probably other tribes had preceded them all through Neolithic times. These Mongolian hordes with cephalic indices from 83 to 88 moved along the western plateau of North America right down into Patagonia, where they are typically represented.

They have indeed made but two important incursions from the main corridor. The first is the great Shoshone-Muskogean migration which has taken brachycephalic Amerinds to Florida and to Lake Michigan. The second is the Carib incursion along the northern coast of South America.

Although the brachycephalics (83-88) are fairly uniformly distributed along the plateaus, there is strong evidence of surges from earlier peoples across their main path. Thus the Salishan peoples are probably of earlier origin (80-82) and occupy British Columbia.

THE SHATTER BELTS

The last migrations have apparently been by far the most violent. They have found the world already occupied by more or less settled tribes, and in consequence a tremendous clashing and breaking up of races has occurred. This is especially marked in those regions for which I suggest the name "Shatter Belts" (Fig. I, Pl.I). The main line of disruption occurs all along the Great Corridor from the Malayan region through China, eastern Siberia, and the western coast of America. Here the débris of primitive tribes is

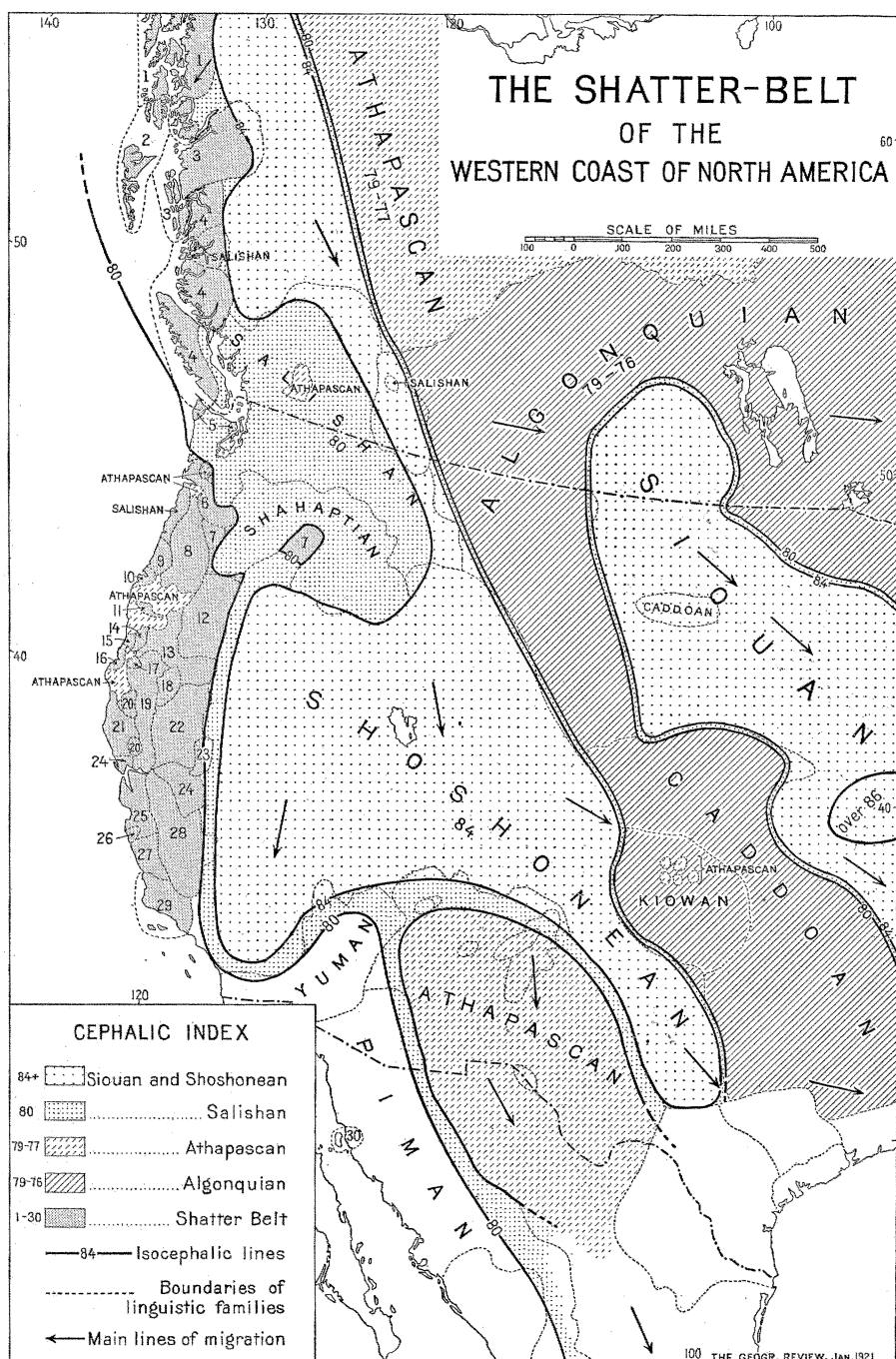


FIG. 2—The “Shatter Belt” of the western coast of North America. Ethnically and linguistically the term “shatter belt” is applied to a region, marginal to main routes of migration, occupied by a “mosaic” of tribes. The tribal distribution shown above is from the map by J. W. Powell (revised) accompanying “Indian Population in the United States and Alaska, 1910,” Bureau of the Census, 1915. The linguistic families in the shatter belt are (besides Athapascan and Salishan): (1) Tlingit, (2) Haida, (3) Chimmesyan, (4) Wakashan, (5) Chimakuan, (6) Chinookan, (7) Waitatpuan, (8) Kalapooian, (9) Yakona, (10) Kusan, (11) Takelma, (12) Klamath, (13) Shastan, (14) Quoratean, (15) Weitspekan, (16) Wishoskan, (17) Chimarikan, (18) Yanan, (19) Wintun, (20) Yukian, (21) Pomo, (22) Maidu, (23) Washoan, (24) Moquelumnan, (25) Costanoan, (26) Esselenian, (27) Salinan, (28) Yokuts, (29) Chumashan, (30) Seri. Notice especially the Athapascan portion of the mosaic separated from the main tribe by the migration of brachycephalic Siouan and Shoshonean along the main corridor.

scattered like scum left by a great wave. Perhaps a closer simile is the line of shattered and altered rocks which marks the course of a great line of disruption in the earth's crust.

We find the mixed races of the Malayan region inextricably tangled. The Ainu and the Paleo-Asiatics occur in northeastern Siberia. Down the coast of British Columbia and California are four times as many distinct tribes as in the rest of North America. The small dolichocephalic tribes of California have been pushed to the west by the stronger brachycephalic folk. The important tribes of Athapascans of New Mexico are longheads, as are also many of the Piman tribes of Mexico (see Fig. 2).

Probably each of these shattered American tribes has a counterpart in the broader territory of the eastern peoples. We know that this is true of the Athapascans of Oregon and of the northern Plains. It is highly probable that the Salishan folk were originally connected with some of the (Sioux?) tribes of Iowa and Dakota. The Seri (76) of the Gulf of California are most marvelously preserved, and the congeners of these Iberian people will probably be found in the extinct Hurons of the far east, or possibly in the Tupi-Guaraní people of South America. Similarly we get Pano (in the Huallaga and Marañón basins) in the north and Yahgan in the south of South America, Bororo in Matto Grosso and Tehuelche in Patagonia as probable disrupted pairs in the southern continent.

In South America there is another shatter belt, where the more primitive tribes are driven down against the impenetrable forests of Brazil from their old highland homes. A crescentic belt of mingled tribes is shown by Chamberlain¹⁷ in his ethnological map of South America. It starts in Colombia between the Chibcha and Carib regions. It continues southward between the Aymará and Arawak (forest) tribes. It curves round to the east about the Tapuyan tribes of eastern Brazil.

In the Old World the finest example is perhaps in the Caucasus, where Ripley shows a whole series of peoples from the longhead Kurds (77) and Tates, through the Alpine Abkhasians (probably from the Altai Mountains) and Ossetes (81-82; from the Pamirs center) to the Armenians (85; from the Pamirs) and Mongol Tatars (from the Altai center). Another such belt occurs along the margin of the Abyssinian Highlands where Sudanese, Bantu, Hamitic and Semitic tribes clash together.

LATER ARYAN AND MONGOLIAN MIGRATIONS

The great Polynesian migration occurred probably as a result of the Chinese thrust from Central Asia. Linguistic and ethnological data link the Polynesians with the Koreans, Japanese, Formosans, Indonesians, and Javanese. Legends and genealogies show that about the dawn of our era the early Polynesians were among the Malay islands. By 450 A. D. they

¹⁷ A. F. Chamberlain: Linguistic Stocks of South American Indians, with Distribution-Map, *Amer. Anthropologist*, Vol. 15 (N. S.), 1913, pp. 236-247.

had reached Samoa and by 850 A. D. Tahiti. Somewhat before this one bold Polynesian had reached Polar ice in his huge war canoe. In 1175 A. D. the primitive Moriori (77) were driven out of New Zealand to the Chatham Isles. No doubt New Zealand was first reached several hundred years before this. Tahiti seems to have been a center of dispersal, as Percy Smith has pointed out in his interesting book "Hawaiki." We must however remember that Melanesians preceded the Polynesians to many of these islands at a much earlier date.

No doubt the early Mongolian folk of China and Japan were equally skillful sailors. It seems possible that some of the tribes migrated to America about the same time. The resemblances between the cultures of the Haida (82) and the Polynesians (80-83) have often been pointed out. Moreover, just as in Europe the Alpine roundheads (83) in part preceded the Teuton longheads (77), so we may perhaps see something of the same sort of anachronism in British Columbia; i.e. that the Salishan "spearhead" penetrated the more brachycephalic surrounding tribes instead of preceding them, as is almost invariably the case (see Fig. 2).

It is only so late as 1200 B. C. that the Aryans first appear in European history. Their exploits are sung in Homer, who describes the wars between the Trojan (dolichocephalic) Pelasgians and the Aryan (brachycephalic) Achaeans. The latter entered Europe by the Ural route.

We may picture the Goidels (76-77) at an even earlier time moving to the northwest perhaps from Africa and ultimately reaching Ireland. Then came the Brythons (77), possibly via the Danube, who also settled in Britain. Both these peoples found Iberian Picts in the country before them. The Itali who came down into Italy from the north were very largely composed of Alpine folk. They merged with the Iberian Etruscans and founded the Roman Empire. Many Aryans (Dorians, Achaeans) invaded Greece and displaced the Iberian (Mycenaean) civilization. The Teutons advanced from southwestern Asia along the northern plains of Europe and sent an offshoot, the Anglo-Saxons (79), into England about 500 A. D.

The migrations of the Keltae were both earlier and later than those described above. The Keltae are an Alpine brachycephalic race (83-88) akin to the Cevenoles and in no sense akin to the dolichocephalic Goidels and Brythons, who are also unfortunately called Kelts. They dispossessed Iberian people in France, central Europe, and probably in the north of Spain. I shall refer to the relation of the Keltae to the Teuton and Romance peoples in a later section.

The Slavs (82) are certainly an Alpine race allied to the Keltae, who invaded Europe (including Germany and Greece) in historic times.

The first true Mongol invasions, those of the Huns, occurred in the fourth century before Christ. The Lapps are also a Mongol race who have long dwelt in northern Europe. The Finns are allied to the Slavs but came from far to the east of the latter. Hence their language is Altaic not Aryan.

Part IV

The Evolution of Culture

This is a phase of science which has been treated very fully in many notable volumes. I propose here merely to discuss its relation to the migration zones already described. There have been many suggestions that similarity of custom implies a common origin; but where the custom alone is considered it has not been hard for opponents to show that the similarity of custom may be due to the common tendency of all races to evolve into higher types. I hope that I shall be able to demonstrate that in most cases these characteristic customs accompany marked anatomical resemblances. This union of such dissimilar criteria must surely point to a common ancestry of the several peoples concerned.

ZONE I, NEGRITO TYPE

It is very difficult to correlate the Negritos, for two reasons. In the first place they are very shy and have nowhere been adequately investigated. In the second place there seems little doubt, as I have previously remarked, that there are no true Negritos left.

Dr. Birkner believes that there are varying stages of dwarfishness and that the Asiatic Negritos are only partially dwarfed. Some of the pygmies have the limb proportions of children rather than those of adults; and, as Duckworth logically suggests, these would seem to be the most primitive.¹⁸ In the latter case the legs are shorter and the trunk longer than normal, and such features occur in the Uganda Negritos.

There seems no doubt that the Tasmanians were Negrito half-castes with the Dravidian Australians. As Sollas shows, the low cranial vault occurs in 75 per cent of the Tasmanian skulls; in 65 per cent of the South Australian, in 40 per cent of the Victorian, in 26 per cent of those in New South Wales, and in only 3 per cent in the highest Queensland aborigines. The language of the Victorian Kurnai and Narrinyeri is also allied to the Tasmanian. The latter people were collected together in 1835 and only numbered 203. In 1847 there were 48; in 1854, 16; in 1865, four women; and the last (Truganini) died in 1877. There are, however, a number of half-castes (with some white blood) still alive on Flinders Island in Bass Strait.

THE PURE NEGRITO EXTINCT

There is no doubt that similar racial annihilation has often occurred in the history of man. To my mind this explains why we find no *dwarf negroid with peppercorn hair* (i.e. Negritos) with a lower head index than 73. The stronger Negro stock of Melanesia and of the Guinea Coast have

¹⁸ Duckworth, *op. cit.*, pp. 483 *et seq.*

skulls with indices of 70 or lower. These Negroes are purer races than the Negrito of today but have been evolved later than the original (extinct) Negrito.

The culture of these (half-caste) Negritos is always low but varies with the proportion of foreign blood. The culture of the Tasmanians may be taken as representative of the lowest. They usually went naked but occasionally wore skins. They gashed themselves as a sort of primitive ornamentation. They built nothing so useful as the Australian "wurley," though the Tasmanian climate was much colder (55° F.). They used plain

TABLE II—NEGritos AND ALLIED FOLK

	NAME	CEPH. INDEX	CAPACITY (in c.c.)	HAIR	SKIN COLOR
Africa	Bambute	79.2	1,400	Peppercorn	Black
	Akka	74.4	1,100	Peppercorn	Red-Yellow?
	Batwa	74 ?		Peppercorn	Black
	(Bushman)	74.5	1,331	Peppercorn	Yellow
Australasia	Tasmanian	74.0		Frizzy	Chocolate Brown
	Tapiro	79.5		Frizzy	Black
	New Britain	73.0		Frizzy	Black
	Islanders				
Asia	Semang	76.2	1,230	Peppercorn	Chocolate Brown
	(Sakai)			Wavy	Black
	Aeta	79.6	1,419	Peppercorn	Chocolate Brown
	Andamanese	82.1	1,266	Peppercorn	Black
	(Veddah)	71.5		Wavy	Red-Brown

wooden spears and clubs and rough stone scrapers and choppers. They had a rude raft like the Californian balsa, which probably enabled them to cross the narrow seas from Asia to Australia.

In Africa there are many grades of Negrito from the Batwa, Bambute, and Akka up to the Bushman (the last, however, are more properly considered with the Aurignacians or primitive Iberians). Similar variation is found in the southeast of Asia. The Kalangs of Java are now extinct but were extraordinarily simian in appearance. The Andaman Islanders resemble the Tasmanians in their low culture. The Sakai and Semangs of Malay have a considerable amount of Malay blood in their veins, but the latter show extreme prognathism. Many of them, like the Tapiro of Papua, are quite wild and keep aloof from civilization.

The Aeta of the Philippines have a head index of 82 which is much superior to that of most Britishers (78). They are undoubtedly Mongolian-Negrito hybrids. Some of these Negritos are thus brachycephalics, and naturally the higher hybrids are the least shy and therefore the best known

It seems wrong, however, to say that this primitive human type is normally brachycephalic,¹⁹ for the more primitive Negritos are precisely the more dolichocephalic. They are already known with indices as low as 73 (New Britain) and 74 (Tasmania), and we may yet discover fossil examples of their crania below 69.

ZONE II, THE NEGRO RACE

There are two well-defined regions occupied by the *lowest* Negro races. In Africa are the Sudanese and West Coast races, in the Australasian region are the Melanesians and Papuans from New Caledonia to New Guinea.

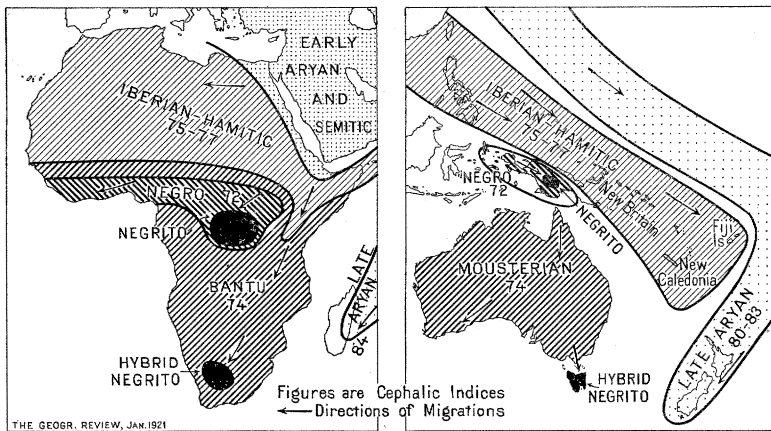


FIG. 3.—Maps showing the distribution of races in Africa and Australasia (generalized). The parallelism suggests that the center of dispersion lies symmetrically between them, i.e. in Central Asia.

These resemble each other very closely in physical characteristics, as the following table shows.²⁰

It is necessary to remember, however, that the Melanesian region, small as it is, is occupied by the representatives of many major races (see Figs. 3 and 10).

If the separation of the two lowest Negro types occurred in the Mindel Ice Age or thereabouts—as I postulate earlier—there is not much likelihood of any great resemblance in the customs of the two folks. Almost everything characteristic must have developed since that date, except the anatomical features mentioned previously. But in the drum language and in the totem and brotherhood institutions we have undoubted similarities between the *lower* Melanesians and the West African blacks. The primitive (i.e. complicated) nature of the structure of the languages is common to both; but, in view of the little knowledge which we possess on these points, one cannot stress this analogy.

¹⁹ A. H. Keane: *Ethnology*, Cambridge, 1895, p. 243.

²⁰ After De Quatrefages from Keane's "*Ethnology*," p. 264.

A more interesting and suggestive parallel is shown by the geographical distribution of all the races in these two contrasted regions (see Fig. 3). Typical Aryans (77-80) are rare in both.

The true Papuans and western Melanesians (who also speak Papuan), with a head index about 72, have all the character of the lowest Negroes.

TABLE III—PARALLELS BETWEEN THE AFRICAN AND AUSTRALASIAN NEGROES

	CEPHALIC INDEX	CRANIAL CAPACITY	FACIAL INDEX	HAIR	SKIN COLOR
Central Africans	71.2	1,424 c.c.	70	Woolly	Chocolate to sooty
Melanesians	70.4	1,412 c.c.	69	Woolly	Chocolate to sooty

They are very excitable, voluble, and laughter-loving and even more cruel than the African Negro. In both cases it seems possible that early closure of the sutures of the skull prevents the growth of the brain. The Papuans of Astrolabe Bay could not kindle an extinguished fire and often ate their food raw. Cannibalism is still rife in the interior of Papua. They have the most primitive social institutions, and even totemic systems are undeveloped

TABLE IV—RACE PARALLELS IN AFRICA AND AUSTRALASIA *

CEPHALIC INDEX	RACE	ENVIRONMENT	AFRICA	MALAY-AUSTRALASIA
?	Negrito (a) (b)	Forests Cooler lands in extreme south	Batwa, etc. (Bushmen?)	Tapiro, Aeta, Kalangs Tasmanians
71	Lower Negro	Equatorial forests and park lands	Peoples of Guinea and Upper Nile	New Guinea Southern Melanesia
73	Higher Negro	Cooler park lands	Bantu	Australian
75 to 77	Hamitic and Semitic	Curving around to east of Negroes and equatorial forests	Ethiopians Masai Hottentot	Igorots and Micronesian Higher Melanesians Solomon Islanders
80 to 85	Aryan and later seafarers	Islands to east	Hova of Madagascar	Polynesians

* The Melanesians can be divided into four main groups. The most primitive (71-73) live in the south in Fiji, the New Hebrides, and New Caledonia. The next group (73-75) occupies the eastern end of Papua and the Dentrecaesteaux Isles. The cephalic index of the Solomon Islanders is variable round 77; and that of the Papuan coast peoples from Hall Sound to South Cape is around 79. Allied to the latter are the Bismarck group.

for the most part. There is a tendency, however, to accept some animal, e.g. a crocodile, as a "god." In the Loyalty Isles their gods are mostly evil and (as among some of the Bantu folk) harrow the whole life of the tribesman.

In Africa, owing to his proximity to the Hamitic tribes and especially as a result of Moslem proselytizers, the Negro has developed a relatively high culture. But where this stimulus is absent he is much the same as his long-lost brother the Papuan of New Guinea.

The Bantu have no close homologue in Australasia. The Australian has much the same cephalic index (74), but the hair is curly and not woolly like that of the Bantu. No doubt the African is the more primitive biologically, but there is no comparison in the cultures of the two peoples. Nothing is so dangerous to a people as complete isolation. The natural barrier which preserved the Australian aborigines from invasion also resulted in their remaining in the same low state of civilization for 100,000 years. At the first approach of a more progressive race they have almost vanished from the face of the earth.

There is a fairly close connection between the West Coast Negroes and the Bantu. The Wolof of Guinea and the Bantu language are somewhat akin.²¹ Mandingo and Bechuana have similar totems. The Bantu religion is ancestor worship in the east and spirit worship in the west. Throughout, however, there is a strong belief in witchcraft and in gross superstitions.²²

ZONE III, THE MOUSTERIAN RACES

The most primitive examples of this zone are found in the Australian aboriginal. Though the latter is remarkably homogeneous, yet there are three major groups. The Victorian and South Australian coast blacks seem to have been the most primitive as stated previously. For instance they have no class organization.

The tribes of inland Queensland, inland New South Wales, and South Australia have maternal descent, and few of them use the womerah (spear-thrower). The tribes of the northern coasts and of the whole western plateau, as well as those of the New South Wales coast, have paternal descent and use womerahs. It is very difficult to decide which of the two latter groups is the earlier. Graebner links the womerah-users and clans using paternal descent with the West Papuans; and the maternal clans with the less primitive northeastern Melanesians.²³ Usually paternal descent, implying that the father of the child is known, is the latest development (see Fig. 4).

As regards means of navigation, there is a natural progression from southwest to northeast. From Shark Bay to Adelaide there are no boats.

²¹ H. H. Johnston: Note on a paper by E. H. L. Schwarz on "The Origin of the Hereros and Ovambo," *Geogr. Journ.*, Vol. 54, 1919, pp. 49-52.

²² A. H. Keane: *Man Past and Present*, rev. edit., Cambridge, 1920, p. 85.

²³ Graebner: *Anthropologie*, 1913.

Along the northwestern coast are rafts only (as also near Burketown, Q.). In the next zone is the bent-bark canoe of Victoria. Then comes the sewn-bark canoe of Wyndham (W. A.), the Gulf of Carpentaria, and the East Queensland coast. Lastly are the wooden canoes of Darwin and the outrigger canoe of Cape York Peninsula.

The totem in Australia (see Fig. 5a) usually represents an animal, from which the tribe is believed to be descended. The name passes to the next generation either by paternal or maternal descent. The totems are often

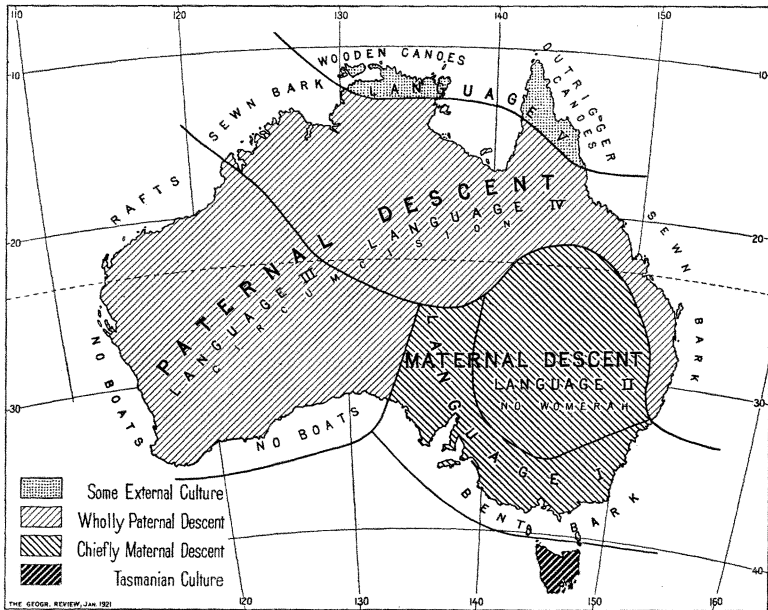


FIG. 4.—The chief culture zones in Australia. Social grouping (descent), language, navigation, etc., are the bases of classification (after Sollas, Curr, and Graebner).

arranged in two classes which specifically control the exogamous marriages. Initiation is marked by bull-roarer music, and usually includes knocking out teeth or (in the paternal-descent region) circumcision. Fire ordeals, i.e. kneeling on burning fagots, etc., are common. Belief in magic is universal, while the wizard is credited with being able to suck out illnesses and remove "poison sticks." This latter custom is found in almost all primitive cultures.

After a death the widow besmears her head with pipe clay and wears a chaplet of bones. This is buried in the grave a year later. The Arunta used crouch burial, and other central natives use platform or tree burial. Later the bones are collected. In Melville Island (N. T.) twelve carved grave posts are placed round the grave. It is obvious that many of these primitive customs are found in every continent, which is what one would expect. The important point to notice is that these aborigines have evolved

a complex system of totems and customs which cannot have been borrowed since they reached Australia. Thus father and mother descent both occur in this very primitive group, and so do many burial customs; so that these cannot be used *alone* to differentiate the other races of the world.

DISTRIBUTION OF THE BULL-ROARER

The bull-roarer, as Haddon shows,²⁴ has survived throughout Europe as a toy, but in connection with sacred mysteries it was used in ancient Greece, on the West African coast, among the Kaffir, throughout North America (among the Eskimos, Kwakiutl of British Columbia, Apache, Hopi, Navajo), and in the Solomon Isles and New Guinea. In fact he calls it the most ancient and widely spread religious symbol in the world. Circumcision also is in vogue from these low peoples in the northwestern half of Australia up through tribes of Loango, the Copts, the Persians, the Aztecs, and Caribs.

TOTEMISM

Totemism is almost equally widespread. The chief regions are Australia, Melanesia, central and western Africa, and North America. There are also relics of totemism among the Dravidian hill tribes, as we should expect from their similar ethnology (see Fig. 5a).

Totemism occurs only among the lower tribes with indices from 72 to 78. It varies in character in the different regions. In Australia when grubs are scarce the tribe gets a man with the grub totem to propitiate his totem by stroking its stone representative. Sooner or later this results in an abundance of the delicacy!

There is a tremendous ethnological and geographical gap between the Australian aborigines (74) and the Amerinds (74-78) of the eastern United States, where totemism is also very strikingly represented. But we should remember that America is now isolated from the Dravidian peoples by a whole continent of Mongolian peoples of high cephalic index. No doubt the Iroquois (74) and Algonquians (76) carried their totem customs with them from Asia, where they are still found in southern India. Probably intermediate tribes using totems are recorded around the fringe of the Mongolians.

Although some totem tribes in America believe that the totem group is under the tutelage of the guardian spirit, yet exogamy, taboo, and class names exist where there is no cult of the guardian totem. The clan totem descends, but the personal totem is acquired by the youth going off to a favorable locus to dream of his desired totem. The Tlingit, Haida, and Tsimshian tribes (79-83) have animal totems, but they do not believe that they are descended from them.²⁵ Evidently here they are merely clan badges.

²⁴ A. C. Haddon: *The Study of Man*, London, 1908, pp. 277-327.

²⁵ Handbook of the American Indians, *Bur. of Amer. Ethnology Bull.* 30, Washington, D. C., 1907-1910, article "Totem."

MAPS SHOWING THE CORRELATION OF CUSTOMS WITH CEPHALIC INDEX

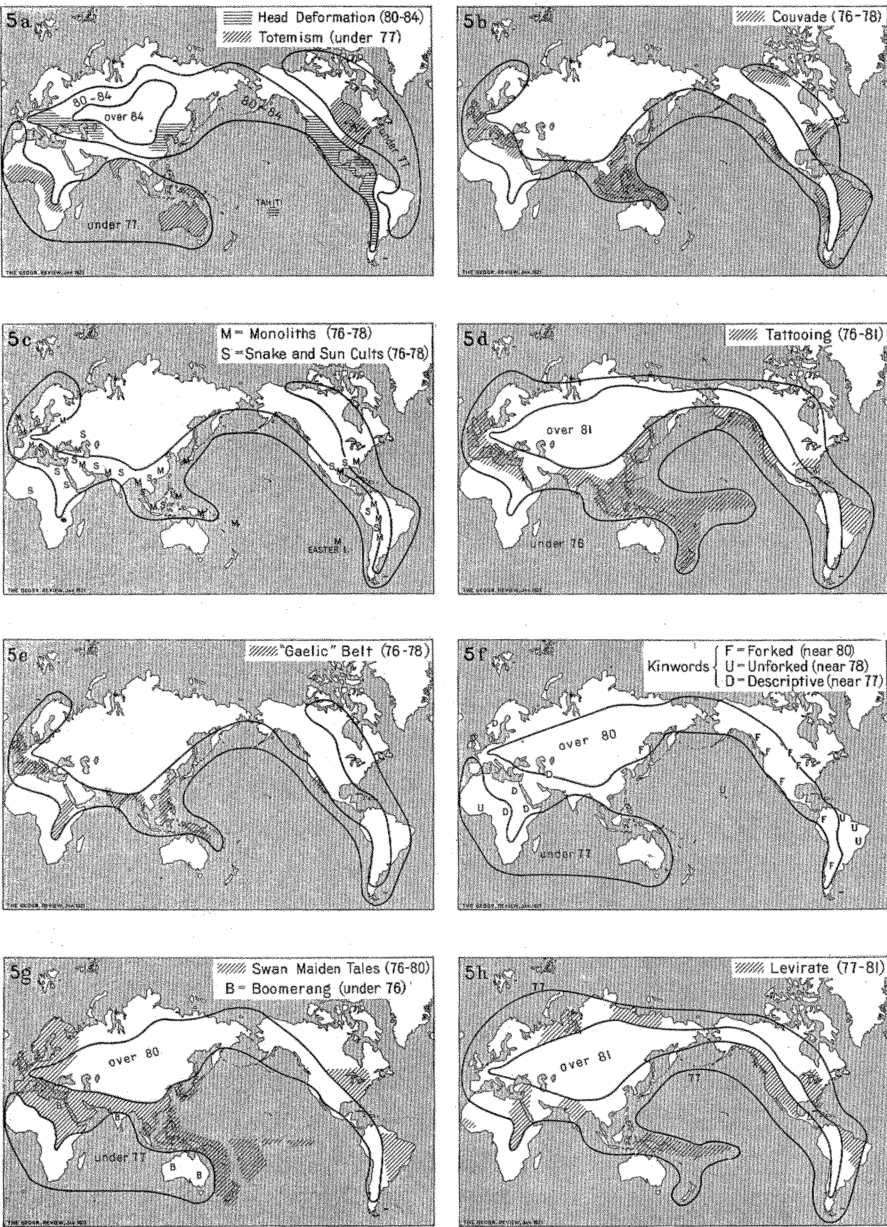


FIG. 5

Another primitive custom which originates in the earlier strata of culture is mummification. This occurs among many of the people using totems, e.g. Dravidians, eastern Australians, tribes of the eastern United States, and through Africa.

THE BOTOCUDO

The South American Mousterians, the Botocudo of eastern Brazil, are much nearer to the Australians than to other races. The index is 73-76, the skull is marked by prominent superciliary ridges, by a keel roof, and by a deeply depressed nasal root. The Botocudo have hardly reached the stone age. The women seem to be constantly subjected to barbarous treatment, being scarred and gashed as were some of the eastern Australians. The dwellings of the people are formed merely of branches stuck in the ground and accommodate two or more families. They sleep without any covering and often in the ashes of their fires. The chief differences are in that very variable factor, the color of the skin, and in the lack of hair. The latter may have originated through depilation perhaps assisted by sexual selection.

THE DRAVIDIANS

The Dravidians of India have been preserved from the stagnation of Australia by the stimulus of repeated invasion. Only a few hill tribes in southern India are so low in the cephalic scale as the Australians, e.g. Badaga and Sholaga (72), the Toda (74) of the Nilghiri Hills, and the Veddah of Ceylon. These Kolarian folk possessed the boomerang, and it seems probable that the very ancient Egyptians, with about the same index (73), used it also (see Fig. 5g). The languages of southern India and Australia are both agglutinative with many suffixes. The curly and abundant hair of the Australian is only paralleled by the allied Todas of India and by the Ainu of Japan, who are slightly higher in the scale.

In group marriages and the allotment of temporary wives at initiation festivals almost exactly the same observances are followed among the Victorian aboriginals as among the Nairs of the Malabar coast of India.

In India and the vicinity we get a continuous series of folk leading from the Sholaga (72) and Veddah (72) up through the other Dravidians (74), the Hindu of Bihar (75), the Santals (76), the Nagas (77), the Kurds (78), the Tates of Caucasia (79), the Baluchi (80), the Parsis (82), the Tajiks (84), and the Galchas (85). This in itself indicates that the center of dispersion was close to India, for nowhere else in the world do we get such a continuous series. Indeed we know that all these folk moved south or southeast, so that their center of dispersion must have been somewhere between the Caspian and Tibet.

ZONE IV, CUSTOMS OF THE FOLK OF THE HAMITIC MIGRATION

As we progress inwards from the Negro belt we reach migration zones which have moved away later from the original home and which have been

less broken by the vicissitudes of history. It might seem at first absurd to correlate such diverse folk as the following: Hottentots, Copts, Etruscans, Portuguese, Punjabi, Igorots, Moriori, Micronesians, Hurons, Seri, and Yahgans. Yet there is strong evidence of common origin when their geographical position among the migration zones is compared with their anatomy and with their customs and languages.

In the first place all have a head index close to 76 and have regular features recalling the well-known "Dago" or gypsy type. In every case they lie outside a belt of people with Aryan affinities, and there is often a belt of negroid folk on their outer margin. They are nearly all characterized by a belief in such extraordinary customs as the *couvade*—in fact the "*couvade horizon*" is one of the most definite of the ethnological strata (see Fig. 5b).

THE COUVADE AND ITS DISTRIBUTION

The world-wide distribution of the *couvade*, i.e. the custom of a father abstaining from certain foods and practices and at times from all exertion whatever for some days or weeks after his wife has borne a child, has been known since classical times. It has been customary to ascribe it to a kind of paternal forethought for the welfare of the child which has arisen *independently* all over the world. But this theory cannot be accepted when its relation to the Hamitic migration zone is demonstrated.

The *couvade* is recorded by old writers as occurring among the most primitive folk in Europe, the Basques, among the Cantabrians, Iberians, and Corsicans (Diodorus).²⁶ All of these have a cephalic index of 76 and belong to the later tribes of the Hamitic-Iberians. Traces of it also occur in several English counties. We hear of it among the ancient Libyans (75) of Egypt. It is found among the Telugu (Telingas) (75) of Madras and in the Nicobar Isles. It occurs right through the Malay islands, as with the Juhuns of Malacca, the Alfuros (76) of Molucca, in Timor Laut, in Amboyna, among the Igorots (76) of Luzon, in Borneo, and in New Britain (76). In the Solomons and New Hebrides Codrington²⁷ shows that the *couvade* is found in San Cristoval, Banks Island, Leper Island, and Pentecost Island. This is along the isocephalic line—*isokeph*—75-76; and here also head-hunting and stonework flourish.

In eastern Asia *couvade* customs occur among the aborigines of Wei-ning (in Kwei-chau), in upper Assam, among the Miao-tse of southern China, and among the Ainu (76) of northern Japan. In America it occurs among some of the Eskimos (76) and the more primitive Californian tribes (76). Traces are found among the equally primitive Yuchi tribes (76). In South America it is especially prevalent. In Guiana the husband takes to his bed for weeks,²⁸ and the custom is found in one form or another among most

²⁶ H. L. Roth: On the Signification of *Couvade*, *Journ. Anthropol. Inst.*, Vol. 22, 1893, pp. 204-243; reference on p. 206.

²⁷ R. H. Codrington: *The Melanesians: Studies in their Anthropology and Folk-lore*, Oxford, 1891, p. 228

²⁸ E. F. im Thurn: *Among the Indians of Guiana*, London, 1883, p. 218.

of the Arawak and Tapuyo tribes of Brazil. It occurs also in the less advanced races along the western coast, which thus resemble the Californian tribes in this respect as in so many others.

This couvade horizon, as it may be termed in accord with geological phraseology, is to my mind sufficient in itself to prove the vast importance of the cephalic index as a clue to human evolution. Ling Roth gives a few other examples of tribes practicing the couvade which I am not able to identify, e.g. Zandardan (of Marco Polo), Tibareni (of Pontus), and Casangi (of Congo); but I suspect that their indices are near 75. As regards every example which I can verify the couvade occurs in the Hamitic-Iberian zone *and nowhere else* (see Fig. 5b). Nor does this system stand alone, though it is perhaps the most readily identified.

THE SERPENT AND SUN CULT

The great serpent cult is of world-wide distribution; and, though it spreads in some form or another throughout later heathen races, it seems to have originated with the Hamitic peoples. The Nagas of the northern Punjab still preserve the worship, which long preceded the Aryan religions of India²⁹ (see Fig. 5c).

The ancient higher Dravidians of northern India (Asura) had cities and a high civilization before the Aryan invasion, just as had the Iberians in Greece and Italy. They were skilled in astronomy and navigation. The cobra (Naga) was the chief object of their worship, while the sun was also venerated. The sacred scourge and the cobra are identical on the Naga gods and on Osiris of ancient Egypt. Both are seen in the insignia of the priests of the highest American civilizations.³⁰ This serpent cult is found in a debased form in Kathiawar and in southern India. Kindred religions were carried from India to Java in the seventh century before Christ, and probably the ancient Elamites and the Abyssinians had much the same cult.

The great Yoruba civilization investigated by Frobenius³¹ is of this epoch and without doubt represents the lost land of Atlantis.³² It was founded long before Phoenician times by colonists of the Etruscan race. The statues dug up at the mouth of the Niger are of the same type as the heads from Sardinia. The voyages of Hanno and Necho were the last efforts to follow the old sea route. Desiccation had previously ruined the land routes across the Sahara; but the oil palm, banana, pepper, indigo, bronze, and strange buildings of Yoruba can clearly be identified in Plato's

²⁹ C. F. Oldham: *The Sun and the Serpent*, London, 1905.

³⁰ See the cap on the chief priest and his "sungal" scourge in the illustration of a Chama vase, *Bur. of Amer. Ethnology Bull.* 28, Washington, D. C., 1904, p. 638.

³¹ Leo Frobenius: *The Voice of Africa: Being an Account of the Travels of the German Inner African Exploration Expedition in the Years 1910-1912*, 2 vols., London, 1913 (translation of the German "Und Afrika sprach . . .", Berlin, 1913).

³² The destruction of Atlantis and the deluge myths may refer to the drowning of the coasts of the deep Mediterranean Basin when the land bridge of Gibraltar broke through (see Fig. G. Pl. I.).

account of Atlantis. The Yoruba and Vei tribes have a head index of 76 like all the other Iberian and Etruscan peoples.

The Mycenaean and Etruscan civilizations are so well known that it is unnecessary for me to dwell on their features. The Basques are an interesting relic of Iberian times in that they alone in all Europe have preserved their Iberian language almost intact. In fact it seems certain that there has been a sort of *retrogression* here; for, though most of the Spanish Basques have a head index of 76-78, the language has spread into some of the Alpine Cevenole (83) villages in France. Probably they made common cause against the invading Franks in the far past. I have met with no other example of retrogression that is quite so striking, but doubtless the same phenomenon has affected many minor races. The alliance of Basque with the other Iberian languages of Berber and Libyan is now universally allowed.

If we admit an advanced Iberian civilization in Egypt in 8000 B. C., then in my opinion we should not be surprised to find that much earlier Iberian migrations carried the great part of their cult with them to America perhaps twenty or thirty thousand years ago. No doubt many of the earliest monuments of Egypt and America were constructed of wood and have long ago disappeared. The power to work in granite and other hard materials was but slowly developed. It is possible that these perishable monuments date back to the common Asiatic breeding place, and that in some such fashion may be explained the extraordinary similarity in structure and detail which occurs in the architecture of Yucatan and of Cambodia. The ritual is of course more easily distributed than the architectural skill. We may compare the snake dances of the Hopi and the ritual of Peru with the snake cult of northern India. There is little doubt that the sacred dragon of China, the serpent of Aesculapius, and even the serpent in Eden are developments of the serpent cult of northern India among much higher races than the originators.

ZONE V, THE NORDIC MIGRATION

Immediately succeeding the typical Iberians come the Nordic races. Sergi classes them with the Iberians, while some German ethnologists unite them with the Teuton Aryan peoples. They have larger frames and are usually fairer than the Iberians. They are usually characterized by long, curly hair and flowing beards. In many places we get a merging with true Iberian peoples.

The Druids and Vikings are popular types belonging to the Nordic peoples. The Kabyles, Santals, Ladakhi, Pathans, and Ainu seem to have many features in common besides their cephalic indices. It may be that the Seri of California³³ and many of the Iroquois peoples were originally

³³ McGee states that the outcast Seri called Kolusio "shaved regularly and might apparently have grown moderately stiff but straggling mustaches and beard" (W. J. McGee: *The Seri Indians*, 17th Ann. Rept. Bur. of Amer. Ethnology, Washington, D. C., 1898, pp. 1-344).

hairy but have lost this covering through sexual selection or even partly through constant depilation.

MONOLITHS AND TATTOOING

Monolithic monuments and tattooing are characteristic of most of the folk on the border line of the Iberian and Aryan zones. Naturally monolithic monuments like Stonehenge are better preserved than the tattooing of our ancestors, but both indicate that the early Britons (76) were akin to the Nordic folk. Monoliths occur throughout western Europe, in eastern and southern Russia, around the Caspian Sea, the Mediterranean Sea, and the Red Sea. They are very common near the Persian Gulf, throughout the Deccan, in Farther India, in Japan, and in much of China. They have been erected throughout Micronesia and Polynesia even to Easter Island. They are especially prevalent in Mexico and Central America, and perhaps the most striking of all are near Titicaca in the central Andes.

It has recently been shown that Melanesians (77) (akin to the Moriori, Caroline, and Solomon Islanders) built the famous Easter Island monuments.³⁴ Exactly similar heads have been described from Yap in Micronesia where also occur walled tombs like those found in many parts of the Old World.³⁵

We know that the Melanesians of New Guinea make long voyages in their huge canoes from Moresby, and no doubt the Easter Islanders did the same long before the Polynesian (83) migrations invaded the islands and wiped them out. Possibly these islands had a more bracing climate in the early days, which incited the natives to build monuments that the languid Polynesian of today has no desire to rival or copy. It may well be that here again we have evidence of the deterioration in climate of our warm temperate regions.

As regards tattooing it has apparently developed slightly later. Of course the custom has died hard; gypsies, sailors, and the lower white classes generally still keep up this habit. Many of them are indeed direct descendants of the folk who tattooed in prehistoric times (see Fig. 5d).

The Japanese (78), Igorot (76), Marquesan (78), and Maori (78) are perhaps the chief exponents of the art. It also occurs in America among the Western Eskimo (78), Haida, Caddoan (Wichita), Kiowa, Sioux (Omaha and Osage), and Chippewa (Ojibwa), as well as among the cognate Carib and Arawak tribes in South America. The Hupa women of California (79?) were marked with two signs on the chin in just the same fashion as the

³⁴ For recent discussions of the problem see Scoresby Routledge: *Easter Island*, *Geogr. Journ.*, Vol. 49, 1917, pp. 321-349; and Mrs. Scoresby Routledge: *The Mystery of Easter Island*, London, 1919.

³⁵ F. W. Christian: *The Caroline Islands*, New York, 1899.

Maoris (78). All these tribes have indices from 78 to 81, and we may notice that the Haida of British Columbia use linear tattoo marks which Christian compares with those of the Marquesan Polynesians.³⁶

SEMITIC AND EARLY ARYAN CUSTOMS

No myth has received greater support than that of the Lost Ten Tribes. As explained previously, there is much truth in the idea if we realize that the Jews are a very small section of a huge migration dating back for say 50,000 years. Allies of the Jews are found all round the world. The hooked nose recurs in Africa and Melanesia. In some of the northern Solomons, about one man in five has this pronounced feature, and here they are generally known as the "Black Jews" (77). They are more industrious than the Samoans (80-82), and the writer has seen them in Upolu (Samoa) where they are employed on the coconut plantations.

The Syrian Jews were a very advanced race, in fact in their moral and religious beliefs they seem to have eclipsed every race at the dawn of history. But their confrères of Africa and Melanesia have no such high civilization, though many of the customs are similar. Many of the primitive Aryans seem to have been characterized by premarriage communism.³⁷ Thus the Nagas, Boros, and other tribes of Assam build communal barracks (morongs) for the youth of both sexes. As a result, juvenile chastity is unknown. Tattooing and head-hunting are common, and these tribes often live in pile dwellings. The morongs, jew's-harp, and other features are found in Formosa, Borneo, the Solomon Isles, New Britain; among the Gonds, Kols, Oraons, and Santals of India; and also among the Masai (see Fig. 5e).

To this zone belong the Goidels (Scotch Highlanders), and the description of some of the Assamese and Burmese might almost fit the Highlanders (76). The Khyengs (76) of Burma³⁸ have a respect for pedigree, and blood revenge is a duty. They are fond of strong drink, are very hospitable, are afraid of the evil eye, have a very clannish feeling, and are notably closefisted. The allied Nagas³⁹ go further, for they wear a clan tartan and amuse themselves by putting the stone. The tartan kilt also recurs among the Dusuns of Borneo. The Erromangans of the New Hebrides have many customs like the Gaels, e.g. ring stones, keening, funeral feasts, wind-making, etc.⁴⁰ The Seri (76) of California⁴¹ have a form of temporary marriage which is only found elsewhere in the ancient handfasting of the Scotch. They keen at the death of a friend as do all the Gaels (see Fig. 5e).

³⁶ F. W. Christian: *Eastern Pacific Lands, Tahiti and the Marquesas Islands*, London, 1910.

³⁷ S. E. Peal: On the "Morong" as Possibly a Relic of Pre-Marriage Communism, *Journ. Anthropol. Inst.*, Vol. 22, 1893, pp. 244-261.

³⁸ Keane: *Man Past and Present*, rev. edit., Cambridge, 1920, p. 184.

³⁹ W. Crooke: *Natives of Northern India* (Series: *The Native Races of the British Empire*), London, 1907, p. 48.

⁴⁰ H. A. Robertson: *Erromanga, the Martyr Isle*, New York, 1902.

⁴¹ McGee, *op. cit.*

THE EVIDENCE OF KIN WORDS

A very useful branch of ethnology deals with the terms of relationship used by the various peoples. Thus the Semitic and Arabic tribes use descriptive kin words⁴² which are also in vogue among Persians, Armenians, Gaels, Scandinavians, and those Africans who are affected by Moslemism (see Fig. 5f). Most of these are close to the Semitic zone of 76-77.

The Hawaiian type of relationship tends to class all the relations of one generation as similarly akin to the person speaking. Hence all the uncles are called "father" while the nieces are usually "daughter." This is called "unforked kinship" and is found among somewhat higher peoples, i.e. Hawaiian (79?), Karens of Burma (78), Japanese (78), Yoruba (76), Tupi (79), and Arawak (78). The other chief system is called the Dakota or "forked kinship." All near relatives connected to the person speaking *through his father* have this fact indicated, and another sign shows the mother relation. This scheme occurs among the Dakota, Sioux, Chippewa, Tlingit (82), Haida (82), Hopi (83), and amid the Chibcha (81), Sipibo (of the Ucayali), and Araucanians (84?) of South America. It also seems to be present among the Gilyaks (86?) of Manchuria. There is also a queer similarity between the kin words of the Tamil (76), Toda (74), and American Seneca (75?), which seems to show an earlier "horizon" of "forked" kin words, but Lowie is doubtful of their connections.

FOLKLORE

The folklore of these Aryan folk has the same basis all over the world. Thus the Micmacs (76) of New York had an evil spirit Lox (the wolverine) which acted just like the Loki of the old Norse (76) legends. The Algonquian Miamis (76?) held séances in which astral bells and winds were made manifest just as in Britain today. The Muskogee stories are described as coming straight from the Old Testament. The Catawbas have fire dances which recall those of the Sabines.

The belief in a virgin birth, in a personal God, and in a future Messiah is prevalent among many of these tribes, e.g. among the Karens of Burma as well as the Jews. The werewolf myths are also ubiquitous, with the natural change to a more familiar animal. Thus we get the werewolf in France, the weretiger in Perak, the werejaguar in the Amazons and the wereleopard in Africa. The myth of Persephone is current in Japan and in New Zealand. The story of Jason is almost world-wide.

The swan-maiden fairy tale⁴³—in which the hero sees a number of birds descend from the sky and change into maidens—is universal in or near the Aryan zone. In almost all the stories the birds bathe, and the hero steals either clothes or feathers and so wins a wife. This tale occurs throughout

⁴² R. H. Lowie (Culture and Ethnology, New York, 1917) discusses Morgan's data, but neither writer correlates them with head form. See also Lowie: Primitive Society, New York, 1920.

⁴³ E. S. Hartland: The Science of Fairy Tales, New York, 1911.

Europe, among the Santals of India, Annamese, Kurds, Burmese, Japanese, Melanesians, Arawaks, and Algonquians.

CORRELATIONS IN MATERIAL CULTURE

Tools and weapons are often useful guides. Thus the blowgun is found only among the lower Amerinds with an index of 76 or so, e.g. the Iroquois, the Antilleans, and the Jokuns of Brazil. It also occurs among the Malay people of the same zone. The sling bow occurs only in Malay and in the Amazons. Bark-beaters for making cloth occur among the Polynesians and their kinsmen in America. Even tobacco helps us to correlate North and South America. The elbow pipe is found among the more primitive folk in the east of each continent. The cigar is more characteristic of the plateaus and Carib country, where the tribes have a higher index.

THE HIGHER ARYANS—ALPINES, ETC.

It is perhaps well to pause for a moment to consider the composition of the races of Europe today (see Fig. 6). The old ethnological stocks still remain fairly distinct in spite of wars, conquests, and treaties. Nationality is in a basic sense more a question of physical anthropology than most historians would have us believe, though for reasons which I have explained in my earlier paper I am not disposed to place so much stress on stature and color as do many ethnologists.

THE PEOPLES OF EUROPE

There appear to be in Europe representatives of peoples from Africa and from Asia. Of the former we have (1) the old Iberians and (2) many Nordics (see Sergi). From Asia we have probably many Brython and Teuton races, not unlike the Nordics. These are longheads. There are also Alpine peoples (ancestors of the Keltae), such as the early group which may be termed Savoyard-Illyrian. These are roundheads, as are the Cevenoles and less brachycephalic folk like the Slavs. Later again are the non-Aryan Magyars, Finns, Lapps, and Turko-Mongols, who are numerous only in the north and east. The chief European countries may therefore be subdivided as in Table V.

Table V and the accompanying map (Fig. 6) are, I think, very interesting in view of the recent changes in the map of Europe. The Austrian Empire has been dismembered into the fairly homogeneous groups of Magyar, Austrian, Czecho-Slovak, and Serb-Croat-Slovene nations. The Rumanians have received several millions of similar-speaking people, who are however chiefly of Cevenole origin. They are more nearly allied to the Abruzzi and Provençal than to the Wallachian. We see, however, that France has in the past managed to incorporate several absolutely distinct races, and so has Italy. Germany includes dolichocephalics in the north, the middle Germans are allied to the Slav, while the Swabians are very brachycephalic Alpines.

It may be objected that though the Slavs have the same head form as the



Fig. 6—Map showing the correlation of the component nations of Europe. Compare with Table V opposite. The broken lines on the map represent linguistic boundaries.

TABLE V—CORRELATION OF THE COMPONENTS OF THE CHIEF NATIONS
OF EUROPE (GENERALIZED)

COUNTRY	PRIMITIVE IBERIAN (CEPHALIC INDEX 75-77)	NORDIC AND TEUTON (C.I. 77-80)	DOLICHO- CEPHALIC ALPINE (C.I. 81-85)	BRACHY- CEPHALIC ALPINE (C.I. 85-88)	ASIATIC— NON-ARYAN (C.I. 81-87)
Ireland Scotland	Pict? Goidel?	Goidel? Some Saxons			
Wales England	Pict of Devon	Brython Saxon			
France	Basque Dordogne	Norman Gascon, etc.	Cevenole Frank	Savoyard	
Germany		Prussians Saxons, etc.	Bavarian (Austrian)	Swabian	
Spain Portugal	Basque Central Span- ish Portuguese	Andalusian, etc.	Few Gali- cian		
Norway Sweden	Few in moun- tains	Bulk of peo- ple	Few in S. W. (Finn)		Lapp (87) Finn (81)
Switzerland				Swabian Ladin, etc.	
Italy	Corsican Etruscan	Sardinian Sicilian	Lombard Umbrian	Savoyard Ladin, etc.	
Greece	Pelasgian	Type Greek	Many Slavs	Albanian	Turk (85)
Bohemia Poland			Czech and Pole		
Serbo-Croatia			Many Croats	Croat and Serb	Turk (85)
Hungary		Some Teu- tons	Magyar of Plains	Magyar of Carpathians	Magyar (largely Alpine now)
Rumania			West Ru- manian and Wallachian		
Bulgaria			Bulgar		Turk
Russia		Some Teu- tons	Lithuanian Slav Pole		Finn (81-82) Cossack (84)

middle Germans, Finns, and Wallachians, yet there are great differences between them. My opinion is that they are all peoples of the same migration zone, who have however arrived in Europe at very different times and have in some cases started off from different areas in Asia. Thus the Germans came from that portion of the zone nearest to Europe, i.e. in or around the Pamirs. Hence their language is Aryan of a somewhat primitive type. The Finns came from a very distant portion of the zone—probably from the Altai region in Siberia—hence their language is strongly affected by the (later-developed) Tungus speech which was originating here. The Slavs are a race who came from an intermediate breeding place. The Magyars probably came at a much later date from the same cradle as the Finns.

Where the isopleths of head form (isocephalic lines) on the map are crowded together, as in central Italy, we get very sharp differences in ethnology. Where they are widespread, as in northern France, it is probable that we have the greatest hybridization occurring. Finally we must bear in mind what may be called the *mass effect* of a people. In central Europe the very brachycephalic people—though ethnologically higher—were on their arrival more primitive than the southern dolichocephalic people and also at first less numerous. Hence we find them dominated by an earlier civilization (the Roman) and modifying their language accordingly.

We see that the same thing has occurred in Bohemia and Serbia. Here the Alpine folk have adopted much of the Slav language and culture. It must not be forgotten that their own tongue was also Aryan and therefore easily swayed either to Latin, German, or Slav speech. This aspect is discussed later.

Finally, if we turn to China we see there an "Alpine" people coming down in vast hordes into a dolichocephalic—one might say Aryan—region. Here the mass effect causes the Mongolian culture to submerge the "Aryan." But ethnological research can readily detect the primitive peoples covered with a Mongolian veneer.

In Figure 6 we see graphically how difficult it is to disentangle the components of the various nations. Almost the only fairly homogeneous race is the Swiss (86–89) who are all Alpines with very round heads. Yet here there are four languages spoken habitually: i.e. German, French, Italian, and Romansh, besides various dialects!

Following Ripley we find the key to lie chiefly in the cephalic index and in the physiography of the region. Speaking generally of the central regions we find that the Teuton on his appearance drove the Alpine up the valleys, while the Slav drove the Teuton up in turn. This is well illustrated in the basins of the Inn and the Adige.

It is an axiom in these studies that scattered peoples confined to mountainous regions are usually relics of an early migration. The habitat of a tribe is determined by its powers of resistance to aggression. In Europe we have a double confusion which is primarily due to migrations coming in from Africa and Asia, possibly simultaneously; while, more unusual still,

there is no doubt that a large number of very broadheaded Alpines preceded some of the longhead Teutons and most of the other Alpine and Slav races. This is contrary to the general rule that migrations occur in the order of the cephalic index, i.e. from longhead to broadhead.

SCATTERED PEOPLES IN THE MOUNTAIN REGIONS OF EUROPE

We find that the most inaccessible regions in Europe, away from the main corridors and among mountains, are universally occupied by very brachycephalic peoples. Among these are the Albanians, West Rumanians, Rhetians, and Savoyards. These tribes have been herded into the hills and disrupted by Teutons, Franks, Lombards, Huns, and Slavs. Only the dark Provençal and Cevenole of slightly lower cephalic index have shared their fate and may belong to the same period of migration. The Spanish folk (78-80) and those of Guyenne (78-80) have most points in common (save color) with the Nordic peoples (78-82) around the Baltic and North Seas. Possibly they are of the same migration, though one section may have arrived by way of Africa, and the other by way of Anatolia or southern Russia. They seem to have driven the broadheads into the coasts or hills, as in the southwest of Norway and in Poitou.

It seems likely that a medium brachycephalic race followed close after them (83-86) and passed along the plains between the Alps and the North Sea. They occupied the woodlands of Germany and Burgundy driving the dolichocephalic Teutons somewhat to the north and west, and it may have been a similar later thrust that caused the Saxon descent on Britain. These Alpine folk sent a long tongue of Bavarians along the Danube valley. Another pressed to the south, probably leaving many tribes in Rumania, and settled in northern Italy, especially in Lombardy and Umbria. A later stage saw the advance of the western Slavs, who occupied Bohemia and Serbia. They were displaced from Hungary by a much later Asiatic migration of Huns. The latter, however, have incorporated so much Aryan (Alpine) blood that, like the Turks, their language is perhaps the chief feature distinguishing them from their neighbors.

The chief feature of later European ethnology is the resistless spread of the Slav peoples. They have swamped all relics of the longheads who used to inhabit their region. They have driven a Polish wedge between the Prussians and Saxons, and a Bulgar and Greek wedge right down into the southeast of Europe. There is little doubt that Slav blood is quite as important as Nordic blood among the Greeks, while the old Pelasgian (Iberian) blood is only found in Attica and Thessaly.

ALPINES IN ASIA

Although the Alpine folk of Europe are an exceedingly important constituent, their numbers are almost negligible compared with their kin who still remain in Asia, mostly to the east of the Aral desert. Here they occupy

almost the whole of Siberia and Manchuria. Among primitive peoples of earlier origin are the Ostyaks of the Yenisei (76), the Altaians (79), and the Dungans of Kulja (in Turkestan) (79). These are dolichocephalics who have been driven to the tundra and up into the mountains by the overwhelming hordes of Alpine folk. Their culture will doubtless be found to resemble that of their kin in Europe, but I have no data available.

Among the more brachycephalic folk (83) are the Paleo-Siberians (Czaplicka) comprising the Chukchi, Yukaghir, Koryak, and perhaps including the Gilyak of Saghalien. Most of these tribes have a similar culture. The family is the chief unit, the elder people rule and often have shaman powers. Blood revenge is obligatory, though sometimes compensation is accepted (Gilyak). Some of the bear festivals of the Gilyaks have customs recalling the Greek Olympic games. Levirate (compulsory marriage with a brother's widow), lack of chastity before marriage, and group marriage recall the customs of the somewhat earlier peoples of the Aryan clans of Assam. Serving sometimes for three years is necessary to procure a wife among the Koryaks, while the myth of Lot is a well-known folk tale among the Chukchi. A mock struggle at the wedding is a development from marriage by capture which characterizes almost all the tribes of Siberia, from these Paleo-Siberians up to the Chinese themselves.

THE TUNGUS

Somewhat later in development is the Tungus group of people (84-85), who are allied to the Finns and Turks in language and also resemble the Manchus in certain particulars. They have many of the characters of the typical Mongol but are in general more shapely and active with a quick intelligent expression. "All observers speak in enthusiastic language of the temperament and moral qualities of the Tunguses. . . 'Full of animation . . . always cheerful even in the deepest misery, holding themselves and others in like respect, of gentle manners and poetic speech, obliging without servility, unaffectedly proud, scorning falsehood, and indifferent to suffering and death—the Tunguses are unquestionably an heroic people'."⁴⁴

The shaman is the most characteristic feature of their culture. He is the leech, soothsayer, and priest. Some shamans are hereditary, some are elected; and they may be either male or female.

Further to the east are other Alpine folk such as the Dauri of the Amur. Allied clans have tall stature, somewhat regular features, brown hair, light eyes, and even a florid complexion. They are met with in Korea, Manchuria, and parts of northern China. I have no data on their customs.

MARRIAGE CUSTOMS

The levirate is observed by many races of the Aryan zone. In Asia and Africa a few of the lower races such as the Gonds and Semites, the

⁴⁴ Élisée Reclus: *Nouvelle géographie universelle*, Paris, 1881, Vol. 6, p. 712.

Gallas, and some of the Zulu and allied tribes also conform. Generally speaking, however, the custom is confined to races between the isokephs of 78–80. Westermarck gives the following tribes: in America, the Kwakiutl, Tlingit, Oregon, and Miwok (Moquelumnan family) of the western coast, the Wyandot (Huron), Chippewa, and Shawnee, the Aztec and Maya, the Arawak, Tupi, and Warrau; in Oceania, the Samoans, New Caledonians, New Britain and Caroline islanders, and many Malay tribes; in Asia, the Ossetes and Kurds in the southwest (see Fig. 5h).⁴⁵

All these races have relics of marriage by capture, usually taking the form of a mock struggle. But it is significant that Westermarck remarks of the Chinese, "Of capture of wives there is no trace, not even among any of the ceremonies." The ancient Teutons and Slavs really *captured* their wives while among the western Slavs the custom persisted till the last few hundred years; but, though we may be sure that the earliest Chinese also had the same practice, their culture and development have progressed so far that no memory of it persists.

Marriage and social organization in North America have been studied in some detail and agree to some extent with the isocephalic lines. We find that in the Huron tribes (73, etc.) the primitive matriarchate obtained, as in southeastern Australia. Most of the eastern tribes (75–78) had strong exogamous rules. Among the lower Pacific coast tribes (78–80) the clan disappears, and real purchase of brides occurs just as it did among the Romans and Teutons. The Kwakiutl and allied tribes also purchased their wives. The Pueblo Indians (80) are monogamists, and the status of women is higher than in most tribes. The wife may dismiss her husband on a slight pretext. Other social features were more primitive.

LATE ARYAN AND ALPINE PEOPLES IN AMERICA

Owing to the enormous distance between Europe and America (via Asia) we cannot hope for very exact correlation between tribes on similar migration zones. Moreover, mixing and hybridization became much more general as the earth became fuller. Few of the Americans, for instance, retain the well-developed hair and beard of the typical Alpine.

A number of customs have a world-wide distribution along the belt of 79–84 which we are now considering.

HEAD DEFORMATION

Traces of this weird custom are found in the Caucasus (ancient Cimmerians), in the Crimea, in Hungary, Silesia, Belgium, in France and French Switzerland, especially in parts of the Pyrenees and the French Jura. In Asia it is, or was, common among the Turkomans (83). In Tahiti (78–84) it is very marked. America, however, is the classic country of

⁴⁵ E. A. Westermarck: *The History of Human Marriage*, London, 1891.

head deformation. In North America intentional deformation is found among the Natchez and the allied Muskogean tribes (82). It exists more or less from the Columbia River (Salish and Chinook, 80) down the coast to Peru. It is characteristic of the Maya (83) and Toltec people and the tribes of the West Indies (83). It is stated to be difficult to distinguish certain flattened skulls of the Crimea from those of Aymará of Peru.⁴⁶

The use of the vapor bath spreads from Lapland through Siberia and down the northwestern coast of North America. The religions of all these brachycephalic peoples (80-85) are similar. The belief in shamans and the use of magic and jugglery in sickness are universal. Blood revenge, political organization, carved houses, mortuary columns, and other features are common to two such widely separated brachycephalic tribes as the Haida of British Columbia (82) and Polynesians of the same head form.

RITUAL AND THE ZODIAC

Holmes has noted a remarkable similarity between the architecture of Cambodia (82) and Yucatan (83). The temple pyramids in both cases are approached by four stairs with serpent balustrades. The altars are similar. There are even similar dwarf Atlantean figures supporting the doors, and some of the figures show whiskered men.⁴⁷

Even more remarkable is the identity of the signs of the zodiac in Asia and in Peru. The ram becomes the llama, the bull is the stag, the twins are man and woman, the crab is the octopus, the lion is a puma, the virgin is the maize mother, the scales are forks, and the bowman is an arrow, etc. The Maya signs are similar though not identical.

It is not yet possible to show all the stages in the migration, but that the eastern Alpine folk (82) passed to America, probably via the Bering Corridor, can hardly be doubted. Possibly this passage occurred in the Azilian period when, as we know, their more primitive kin invaded Europe.

The general trend of the isocephalic lines seems to show that all the tribes came in from the northwestern corner. It is difficult to conceive how any direct migration from Europe can have taken place. The climatic features have been adverse, and no land bridge has existed during Pleistocene times. There is no doubt that surges from the eastern coast of America towards the west have occurred, but these were only ephemeral and of little importance in the grand problem. In America as elsewhere the most highly developed culture is not, however, usually associated with the most extreme brachycephalism.

In the northern continent the Mayas, Aztecs, and Pueblo Indians had advanced farthest on the path of progress. Their head index is about 82, whereas that of the Plains Indians of the central Mississippi rose to 88

⁴⁶ Paul Topinard: *Anthropology*, London, 1890; p. 179.

⁴⁷ W. H. Holmes: Bearing of Archeological Evidence on the Place of Origin and on the Question of the Unity or Plurality of the American Race, *Amer. Anthropologist*, Vol. 14 (N. S.), 1912, pp. 30-36; reference on p. 35.

(see Fig. 2). In the same way in South America there were four great civilizations, Inca, Aymará, Chibcha, and Calchaqui. I am not able to get satisfactory coefficients; but these also would appear to be about 83, while the unprogressive Araucanians of the far south are 86 and some of the Bolivian Indians 88.

It is noteworthy that the very high indices occur only in three or four isolated districts in America and do not form a large compact group as in Central Asia. These American districts are so far distant from Asia and so disrupted that one wonders if these forms have developed *in situ*, perhaps under stimuli of drought, competition, and elevation such as I postulated in Central Asia. This problem can only be solved locally.

The tribes of America have in general been classified linguistically (see Fig. 2). Nothing else is possible at present, but a scheme which groups Alaskans (84) with Déné tribes (77), or groups Algonquians of various stocks from 78 to 71 or Aleuts (79) with Greenlanders (74) does not appear to the writer to be either genetic or final. Great language *transgressions* have certainly occurred in America as in Europe. The *dominant* race (whether dolichocephalic or brachycephalic) has impressed its speech on the weaker race, but without altering the other cultural features to a corresponding degree. We may hope that in the future the American zones may be disentangled and correlated with the better known races of the Old World.

THE TIBETO-CHINESE GROUP

In many respects the Chinese, who are the dominant members of this group, are worthy of the highest respect. Their Empire has remained virtually continuous for 5,000 years, in fact since the dawn of history. With each century more and more of the surrounding tribes have become amalgamated with it, and it is for this reason that it is the great rival of white dominance. The Empires of Elam, Egypt, Babylon, Persia, Macedon, Rome, and Spain have waxed and waned, and their peoples have become scattered and almost negligible, yet the millions of China still remain consolidated and ready for the awakening that is coming. This is of course due largely to their environment remaining much more favorable than in the other empires.

At almost any period anterior to the last hundred years the Chinese held a worthy place among the nations, so that none should blame them if they condemn the arrogance of the upstart nations of today. Their Empire is so huge and populous that we must first ascertain where the typical Chinese folk dwell. Even when they dwelt in the Tarim Basin the old legends indicate that written characters had superseded the knotted cords (compare the quipu of the Incas) for the purpose of keeping records. The matriarchate had died out, marriage was instituted, and musical instruments were invented. Astronomy and silk weaving were practiced. All this is placed anterior to 2600 B. C. in the earliest Chinese histories.

About 2600 B. C. they migrated through the "Jade Gate" into the upper Hwang Ho basin, and for 2,000 years their capital was in Shensi. There are in existence bronze bowls dating from 2000 B. C., and a large number of beautiful works of art in jade date back to 1000 B. C. Their culture seems to have equaled that of any of the occidental empires. About 800 B. C. the phonetic seal writing was invented, and about 550 B. C. lived two of the world's greatest religious teachers, Confucius and Lao-tse, while Mencius was 200 years later. The Great Wall was built before 200 B. C.

About 120 B. C. their Empire extended to Yunnan. In 30 A. D. the capital was moved eastward into Honan and in 1264 A. D. to Peking by the Mongol Kublai Khan. Marco Polo's record deals with this period when the Mongols and Chinese conquered half the known world. Jenghis Khan and Tamerlane are two other emperors of the thirteenth century who made the Mongol power dreaded by every other nation.

The highest Chinese type is probably still to be found in the northwest along the valley of the Hwang Ho. Data as to the head form of the peoples of Central Asia are not available. Ripley shows a solid block of very brachycephalic tribes (over 88) extending from the Himalayas to Lake Baikal.⁴⁸ All this region is now very inhospitable and sparsely inhabited, but these conditions have only supervened within the last few thousand years.

THE AURIGNACIAN BELT OF LOW STATURE

It seems likely that there was a large population of short Aurignacian peoples in southeastern China, who resembled the modern Eskimo. Hence in this portion of China, which is the chief source of the well-known Chinese coolie, we find squat figures, dark skin, and high cheek bones, which are less common in the regions of higher cephalic index of Tibet and northwestern China (see Fig. 7).

The same short uncouth figure is found round the periphery of the true Mongolian region and seems to be identifiable in Deniker's tables of stature. Thus it occurs among the Lapps (152 centimeters), Samoyedes (155), Chukchi (165), low-class Japanese (157), southern Chinese (161), Annamese (157), and especially in the Mongolians from Burma to Timor (158). All these peoples are near the Aurignacian migration zone of 74-75. We find other races in this zone with the squat figure, as among the Fuegians (157) and some Tupi-Guaraní (157-160) of Brazil. It is of course a feature of the Aurignacians of South Africa—the Bushmen (153). The same zone in Spain gives us Moors (162), Portuguese (163), Corsicans (162), and some primitive French folk. Lastly it is general throughout southern India among the Dravidian folk, i. e. Kurumba (155) and Chota Nagpur tribes.

EARLY MONGOL CIVILIZATION

I suggest therefore that some of the accepted salient features of the Mongolian are relics of a very much earlier migration. In effect they show

⁴⁸ Ripley, *op. cit.*, p. 42.

the hard conditions which the original Aurignacian suffered in his fight against the inclement environment of the Ice Ages. These features are not found so generally among the Mongolians who determined the wonderful Chinese civilization of the centuries.

There seems little doubt that the earliest civilization was developed by the Proto-Mongols, possibly in Turkestan. They were connected with the Sumerians of southwestern Persia and with the peoples of Askabad. Indeed Turkestan is now the only flourishing region which still remains in spite of the secular desiccation which has ruined every country round it.

We find a common tradition among the Chinese and the Akkadians, who were the successors of the Sumerians. Thus the Babylonian priest Berosus

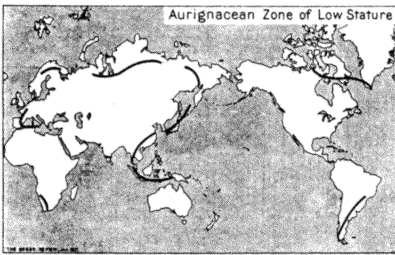


FIG. 7—The Aurignacian zone of low stature. Compare with zone 74 (cephalic index), Fig. G, Pl. I.

(third century before Christ) describes the earliest dynasty as consisting of ten kings and enduring 432,000 years. This is exactly the same as the Chinese story. The Sumerian art, town life, and religious ideas are also said to be closely akin to those of the Chinese. At Susa (Persia) we get artifacts showing a very high civilization at a depth of 50 feet below the surface. They are estimated to date back 14,000 years.

At Askabad in Turkestan are similar relics which greatly antedate the Egyptian civilization.

The Chinese many hundred years ago had evolved a civilization to which we are only now attaining. As A. H. Smith wrote, they are characterized by "a love of industry, peace, and social order, by a matchless patience under wrongs beyond cure, by a happy temperament, by no nerves, and a digestion like an ostrich!" These are pre-eminently the traits which are needed in the workaday world of today. When we realize that the Chinese have natural resources at their disposal which are unrivaled (except in North America), it is obvious that only unremitting diligence, thrift, and sobriety will enable the white man to resist the "yellow peril." This is not a peril of military invasion, such as that by the Huns of old, but an economic peril for which I see few nations of the world educating themselves.

It is often objected that the Chinese are decadent because they have lagged behind in the race. To my mind this is merely a question of wrong education. The World War was largely due to a wrong education which resulted within forty years in the Germans glorifying military aggression. The stagnation of the Chinese was due to a sort of "Yellow China" policy, not very remote from "White Australia" policy. But this is now being abandoned throughout China. We shall see in the next fifty years a new China which will dwarf the old régime just as New Japan, the Britain of the Orient, far surpasses the ancient Empire of the Mikado.

Part V

Environment and Civilization

The foregoing sections aim to demonstrate that civilization is almost wholly a question of environment, at least since the dawn of true civilization in Asia. Table VI shows the ethnology, climatic control (temperature), and date of some of the chief civilizations. From this table we see that excluding the lowest races (75 and under) most of the races have been pre-eminent at

TABLE VI—THE RISE AND FALL OF CIVILIZATIONS
(GENERALIZED)

APPROXIMATE DATE	NATION	ZONE	CEPHALIC INDEX	TEMPERATURE	
				SUGGESTED ANCIENT	PRESENT
B.C. 10000?	Proto-Mongol	Early Mongol*	83?	65°F.	60°F.
8000	Sumerian	Early Mongol	83?	74°	78°
6000	Akkadian	Semitic	77	74°	78°
5000	Egyptian	Iberian	76	65°	70°
4000	Chinese (in Northwest- ern China)	Early Mongol	85	55°	50°
2000	Hittite	Alpine?	83	58°	60°
2000	Persian	Aryan	77	68°	70°
1000	Etruscan	Iberian	76	63°	65°
300	Macedonian	Alpine	81	63°	65°
A.D. 0	Roman	Alpine?	81-83	60°	62°
1100	Saracenic	Alpine and Semitic	?	68°	70°
1500	Spanish	Aryan	79	About 2000 B. C. {	60°
1800	French	Alpine largely	80-83		55°
1900	British	Aryan	79		50°
2000	U. S. A.	Aryan	79		50°

* Early Mongol and Alpine races are variants in the same zone.

one time or another. In America the Maya (700 A. D.), Aztec (1200 A. D.), and Inca (1500 A. D.) also flourished and had their day.

The races with cephalic index above 85 do not appear to have attained eminence. In Europe they have formed considerable but not preponderating proportions in the Roman and French empires. Probably they show their chief merit in the arts, for many of the most famous poets, artists, and men of intellect generally are Alpines from South Germany, Switzerland, and northern Italy. This in my opinion is the highest type living in Europe, and under forthcoming settled conditions we may also expect great things from the western Slav races who are of much the same strain (see Fig. 6).

Furthermore we have seen that it is something very like accident which has determined whether a race shall migrate from Asia to a region of

stimulating climate and bountiful resources like Britain or to the hot enervating Malayan jungles or to the dreary cold of Tierra del Fuego.

What has caused the rise of a race and its decay some thousand years later? Huntington believes that it is very largely a question of climatic change. I do not propose to go deeply into this question but only to discuss the Table VI and the map which is given as Figure H, Pl. I.

If we glance at the temperatures of the ancient civilized lands we see that, speaking generally, the modern civilizations are in cool moist climates, while the sites of the ancient civilizations are nearly all either arid or hot or both.

On a map of the world let us insert the isotherms, not, as usually shown, reduced to sea level, but as they actually exist, modified by elevation (Fig. H, Pl. I). We find that the centers of advanced civilization occur very close to the "actual" isotherm of 50°F., and this is the case in both hemispheres. Thus in the south we have Buenos Aires, Valparaiso, Durban, Melbourne, and Wellington, N. Z. In the north are Seattle, Chicago, New York, London, Paris, Berlin, Peking, and Tokyo. Winnipeg, Montreal, and Petrograd are almost the only large centers on the isotherm of 40°.

Now let us look at the "actual" isotherm of 60°. Here or near are many large cities, which in times past have been of imperial rank, Rome, Athens, Samarcand, and Nanking. We know that they were the centers of flourishing nations one or two thousand years ago. If we take the "actual" isotherm of 70° we find it passes through Egypt, Mesopotamia, the Indus Valley, Cambodia, inland Ceylon and Java, and the Maya region of Yucatan. Most of these were centers of civilization in prehistoric times, about 2000-4000 B. C.

POLEWARD MOVEMENT OF CIVILIZATION

Speaking generally we may say that the belts of *civilization* move poleward. I have shown in my earlier paper (*Climatic Cycles*, 1919) that the *isotherms* and *desert belts* are moving poleward as the earth heats up after the Ice Age. We can hardly escape the conclusion that our boasted civilization, like our ethnological status, is determined by changes in temperature and rainfall.

It is unnecessary to describe the evidence from which we know that the climates have altered within the last 3,000 years. Huntington has dealt with it very fully in various notable books. Hobbs gives a most interesting account of the extraordinary change in the Nile Valley and especially in the Kharga Oasis. "For a period of at least twelve years no rain has fallen in the inhabited portion of the depression. There is, none the less, abundant evidence that in earlier times the region was more favored by climate and supported a large population." Heavy deposits of tufa enclosing leaves of oak are found in the Wadi Refuf near by.⁴⁹ The writer has examined exactly the same type of deposits in the steep gullies of the Flinders Range

⁴⁹ W. H. Hobbs: A Pilgrimage in Northeastern Africa, with Studies of Desert Conditions, *Geogr. Rev.*, Vol. 3, 1917, pp. 337-355; reference on p. 353.

(Depot Glen) in South Australia, where, in a similar latitude, the desert is also creeping polewards into the less arid regions.

The climatic stimulus has been more marked near the cradle of mankind than anywhere in the world, and we have to thank this factor for the evolution of man from the *Pithecanthropus*.

We may separate the regions of Tibet and northwestern China from the remainder in Table VI. Here the temperature has probably fallen somewhat, owing to uplift, but the aridity is the controlling factor. This is a rain-shadow desert and so is not affected to such an extent by the secular swing of the climates. In the other regions we see a steady progression from 78° in Persia to 50° in the United States. In the table I have ventured to insert tentative temperatures to indicate the conditions when flourishing civilizations occurred in the localities named. It will be seen, I think, that, although temperatures in the older centers were more comfortable in the past and less comfortable in Britain and northern Europe than now, it is the movement of the desert belts which has chiefly determined the decay of the old empires.

It may be objected that if Scotland were four degrees cooler in 2000 B. C. we should have had a glacial age in the Highlands. I suggest that the corries were deepened considerably even so late as this date, though no moving glaciers were formed.⁵⁰ The great importance of late cirque or corrie erosion is not yet fully recognized.

THE ZONING OF CIVILIZATIONS

In the map (Fig. H, Pl. I) I have attempted to synchronize the various civilizations. I assume that colossal buildings like those of Boro Budur in Java, Angkor in Cambodia, or the ruins of Titicaca in Bolivia imply many thousands of years settlement before the temples were built. Thus we may perhaps class in the first epoch the Sumerian (and Proto-Mongol?). In the second epoch are the Akkad and Egyptian. In the third epoch are the early Chinese, the Cambodian, the Hittite, and possibly the Maya of Yucatan and Chibcha of Colombia. In the fourth are the Inca and Aymará civilizations of the Andes, the Greek and Roman, and the Toltec. In the fifth are the hill civilizations of Java and Ceylon, Spain, and central India. Finally today we have the sixth epoch with the centers already described. While opinions may differ as to the details of this generalization, yet I think the main principle that civilizations occur in zones must be admitted. One very important conclusion can be drawn from the diagram. If the civilizations grow up in climatic zones, they must be more or less parallel to the equator. We have seen in the early migration maps that the chief corridors are determined by the topography even more than by the desert and forest belts (climatic control.) Let us look at America. Here the migration zones run primarily north and south. Hence they cut

⁵⁰ Griffith Taylor: *Physiography and Glacial Geology of East Antarctica*, *Geogr. Journ.*, Vol. 44, 1914, pp. 365-382, 452-467, 553-571; reference on p. 369.

across the civilization zones, and so we find the anomalies in culture which have made the ethnology so confused. Thus the Alpine tribes who occupied the portion of their special migration zone most favorable for the development of civilization built up the Inca and Aztec cultures, while their blood brothers who were pushed away towards the south remained in a savage state. For the same reason the Yahgans, whose ethnic status was equal to the Etruscans and Gaels, found all their time occupied in searching for food.

In Africa we see the Bantu of the plateaus dominating the Bantu of the coast. In Europe the climatic and ethnic zones are more or less parallel, and the distinction is not so obvious. Yet the ancient Irish Goidel is kin to the civilized Etruscan and Cretan as well as to the savage Todas of India and Nagas of Assam. The Irish tribes inhabited a cold, wet, outlying portion of Europe with the result that right into the Stuart period they were probably the most savage tribes in Europe. To realize this we have only to read the contemporary descriptions by Fynes Moryson (A. D. 1600) or by Spenser and Raleigh. Moryson saw "Young maids stark naked grinding of corn with certain stones to make cakes thereof."⁵¹ Another traveler was regaled by Chief O'Kane in Ulster. "He was met at the door with sixteen women all naked except their loose mantles. . . . Soon after O'Kane, the lord of the country, came in all naked excepting a loose mantle and shoes which he put off as soon as he came in."⁵² The Todas wear exactly this type of cloak, as Gomme suggests.

The earlier Irish warrior when he killed his enemy broke his skull, extracted his brains, mixed the mass well, and, working the compound into a ball, carefully dried it in the sun and produced it as a trophy of valor. He carried the heads of the slain at his girdle just as his blood brother does in Malay and elsewhere. In the interments of the Long Barrow period headless trunks are frequently met with, as are also heads buried separately,⁵³ so that head-hunting was no doubt as prevalent with the early Irish as with the Dyaks.

No Negro tribe has ever reached a high state of civilization. Possibly the most advanced was the Yoruba State on the Niger, but we have seen that this is due to Etruscan influence. This also accounts for their very advanced type of speech. Yet in higher zones it is obvious that all the races have worthy representatives. The Semites (72) at the time of David produced some of the noblest concepts of religion, 500 years before Confucius lived (B. C. 500). The Cretans (75) had a wonderful civilization before the time of Homer. If on the whole the world seems now to be at the feet of the folk of the Aryan zone (76-79) this is due as I have tried to show to many different factors. The future, in my opinion, belongs to the

⁵¹ Fynes Moryson: *A History of Ireland from the Year 1599 to 1603*, 2 vols., Dublin, 1735; reference in Vol. 2, p. 372, cited by G. L. Gomme: *Ethnology in Folklore*, London, 1892, p. 178.

⁵² Moryson: *An Itinerary*, 4 vols., London, 1617; reference in Vol. 4, p. 181, cited by Gomme, *op. cit.*, p. 179.

⁵³ Gomme, *op. cit.*, pp. 146-149.

Alpine races and later to the Chinese unless the white race conquers some of its pet vices.

In conclusion one cannot but realize that, though evolution is governed by fixed laws, these laws have little regard for the individual and not much more for the race. Mighty consequences for good or evil have resulted from what seem to be trivial occurrences in the life of a race, such as the direction of a migration. These appeared of such small importance at the time indeed that the tribe could not possibly have controlled them, and yet one path led to empire and the other to extinction.

Part VI

The Distribution and Evolution of Languages

I have been unable to find any modern geographical treatment of the languages of the world. Too few workers in natural science seem to realize the invaluable help they may bring to research by charting their results—in effect, by using isopleths. In the present paper I have applied the methods used in geology and meteorology with considerable advantage to the studies of evolution and linguistics.

PRINCIPLES

In the first place there are several outstanding principles which may be profitably considered.

1. In languages, as in evolution generally, we may apply the phrase *ex oriente lux*. All the chief languages may be traced back to the Asiatic cradle, which indubitably lay in the Persian and Turkestan areas.

2. The most primitive languages are now spoken in the outermost zone surrounding the center of dispersal. Thus Gaelic is the most primitive Aryan language. Latin is probably next; then come Greek, Teutonic, and Slavonic; and lastly Armenian and other Alpine languages. The earlier families are grouped in order of development outside the zone of the Aryan family (see Figs. 6 and 8).

3. Much confusion has resulted because many languages have been preserved by three major methods, which result in what may be termed *fossil*, *highland*, and *migrant* varieties. The last is the most important and the other two are often wanting. For instance Sanskrit is a fossil language buried under later strata of Prakrit, Pali, Pushtu, etc. Probably its migrant form is best represented in Lithuanian, but it is most important to realize that the Galcha mountaineers on the Hindu Kush (Siah Posh dialect) have preserved a very close approximation to the ancient Sanskrit (see Fig. 8).

4. The geological analogy of *inliers* (where islands of older strata project up through newer strata) and *outliers* (where islands of later strata are left isolated by the removal of their connecting deposits) may also be applied to comparative philology. Thus in the map of Europe (Fig. 6) the Basque

region is an inlier of Iberian speech which projects through the surrounding waves of Romance languages. The Pelasgian relics in Greece are inliers amid the much later languages which constitute Greek. In China the Lolo peoples occupy an inlier amid the encircling Mongolians. The Galcha are probably inliers among Mongolian peoples (see Fig. 8).

Outliers are more numerous, and the three Asiatic languages, Lapp, Finn, and Magyar, are good examples. Their congeners are to be found far away in Siberia, but we know that these tribes extended for a time right across Russia.

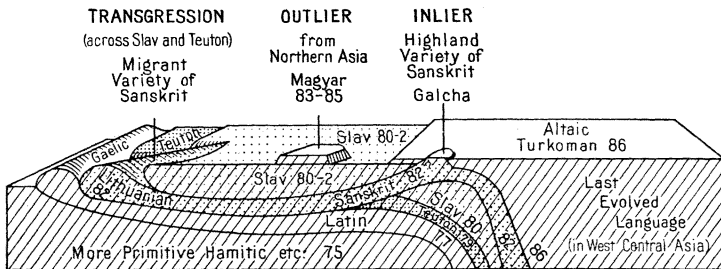


FIG. 8—Block diagram illustrating an analogy of geological structure applied to the migration of language. The order of evolution is that of the cephalic indices (75–86); but the migrations have been somewhat irregular, especially the Sanskrit Alpines (Lithuanians, etc.). Later the Slav tribes dominated the Sanskrit Alpines and were in turn overrun by the Altaic Magyars. Compare Figure 6.

The dominance of a language depends on a sort of mass effect. In Europe the Magyar and Finn have held their own, but no more, amid Aryan tongues. In China the converse occurs and the Lolo—of the Gaelic (?) horizon—have barely held their own among speeches allied to the Lapp and Magyar.

5. The most confusing condition arises when we have a transgression of speech somewhat resembling a transgression in stratigraphy. In this case a later language moves far across the earlier languages, not following in sequence but skipping many intermediate zones (see Fig. 8). An example occurs in Europe in the Alpine folk with a head index of 82–88. They arrived in Europe in Neolithic times, long before the Slavs (80–82) and probably before the Teutons (77–80). The important point to notice is that though they arrived first in Europe their speech was more advanced than that of the later comers.

6. It cannot be too strongly emphasized that the development of race and language of all the Aryans occurred in Asia during probably 100,000 years. Except perhaps in the case of the Gaelic tribes, more of their evolution has occurred in Turkestan or thereabouts than in their present abiding places to which many of them migrated only about 5,000 years ago.

7. The phenomenon of the shatter belt (see Fig. 1, Pl. I and Fig. 2) has been discussed earlier. Just as there are lines of weakness in the crust along which earth movements take place era after era, so there are corridors

THE LAVA-FLOW ANALOGY

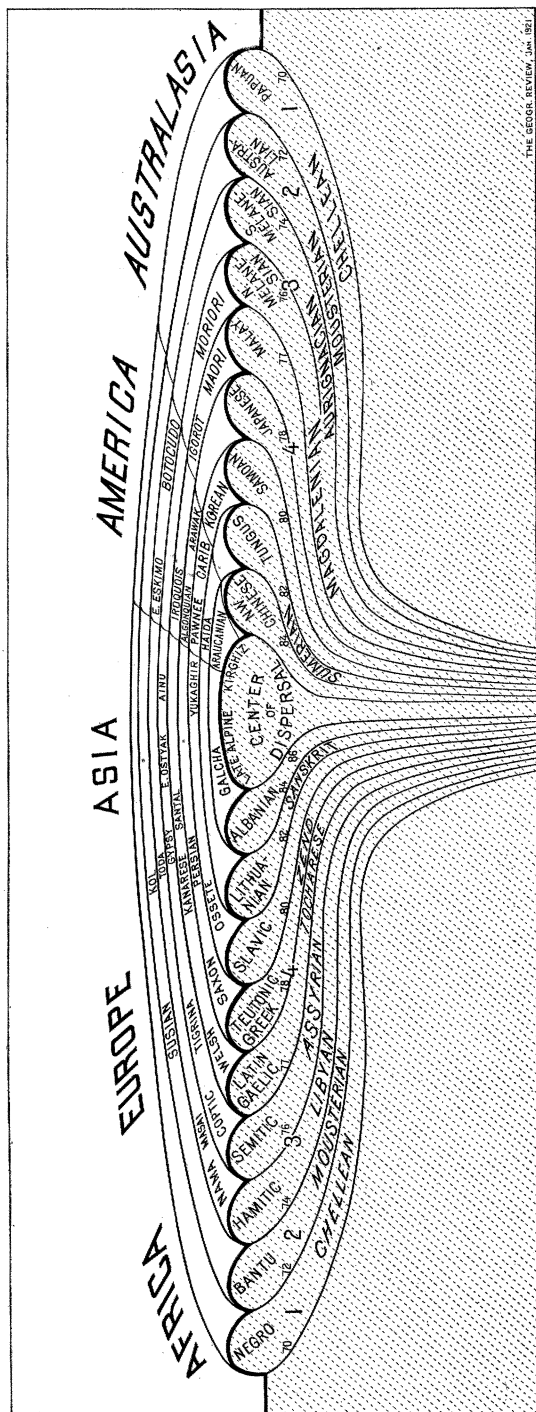


FIG. 9.—The lava-flow analogy applied to studies of evolution and linguistics. The center of dispersal in Central Asia is pictured as a sort of "fissure eruption" sending forth streams of lava in all directions. Each new eruption arises from the center and, while covering some portion of the previous flow, pushes most of the previous lavas out to the periphery. Other analogies are represented in Figure 8. Fossil languages, buried under existing tongues, are seen in section. On the surface are shown existing languages typical of the several migration zones.

along which tribes migrate age after age. In both cases the margins are rent, pushed aside, and in part absorbed. This explains the conditions in the Caucasus and in California and Brazil, where the mosaic of dissimilar tribes flanking the great linguistic families are the débris fringing the main corridors of migration. I have no doubt that the shattered tribes in the Caucasus will ultimately be correlated with their Aryan (Pamir) or Turki (Altaic) congeners of the same cephalic index.

8. No language is at a standstill; but the isolated mountain or forest dialect—far removed from stimuli intellectual or otherwise—alters very little as compared with a civilized language. Nothing accelerates a language so rapidly as the development of writing. The three most advanced languages today are probably Chinese, Persian, and English. Of these English has developed most, for it differs in structure almost entirely from the synthetic inflected Anglo-Saxon and is now eminently analytic and uninflected. Persian has, I believe, undergone a similar change but has taken about twice the time. Chinese probably started with a higher (i.e. more concise and economical) language about 10,000 years ago and had advanced further than English about 5,000 years ago.

9. In all cases the study of evolution becomes much more simple if we ignore the developments of the last 500 years. Western Europe has had unique opportunities in her climate and in her resources. These, coupled with her choice of religion and philosophy, have given her the first place in the world, but it is too often assumed that race is the first factor and that religion is of equal importance, while environment is often ignored! The converse is nearer the truth; for, as we have seen, race *per se* has been only a small factor in the development of civilization.

THE LAVA-FLOW ANALOGY

We may picture the center of dispersal in Central Asia as a sort of "fissure eruption" sending forth streams of lava in all directions. Each new eruption arises from the center and, while covering some portion of the previous flow, pushes most of the previous lavas out to the periphery. If we postulate that the early lavas still retain some mobility and occasionally flow across the later lavas, we get a very close analogy to what has happened in the migrations of man.

I have endeavored to show this in Figure 9. It explains fairly clearly the relations of the "fossil" to the "migrant" languages described above. On the extreme periphery we see the true Negro (70-72), who appears only in Africa and Papua. But we see that Chellean relics *under* the center of dispersal still bear witness that he once lived in all the intervening zone. The next zone is the Mousterian, found all round the periphery in southern Africa, southern Asia, southwestern America, and Australia. Then come the Hamitic, Iberian, and Semitic peoples who have a world-wide distribution as the culture maps have shown.

Here the dead languages begin to help us. We have relics of Iberian writings in many Neolithic scripts, such as those figured by Sergi⁵⁴ from the French dolmens and from Cyprus, Crete, and Libya. The Egyptian hieroglyphs are Hamitic and allied to the modern Coptic. By analogy they may be found to be still more like some outlying Hamitic *migrants* that have preserved the more primitive speech. Assyrian and Babylonian are well known from the clay tablets. Their closest affinities in the same way may well be not with modern Syrian but with some tribes pushed away from Assyria by migrations about 5,000 years ago and now living on the periphery of the Semitic zone, e.g. in Abyssinia.

THE LINGUISTIC PROBLEM OF THE INDO-ARYAN RACES

When we come to the Aryan languages the problem becomes very interesting, for we know more of the philology of the various speeches. My conclusions differ considerably from the orthodox views which I have come across in all textbooks.⁵⁵

The palladium of the philologist is Sanskrit; but it seems evident to me that Sanskrit was first spoken thousands of years after Gaelic, Welsh, Latin, and possibly Teutonic and Greek had come into existence (in the order named).

The characteristic of the earliest Aryan tongues is the prevalence of the *k* sound (often as *qu* or *kv* or *kw*). This appears in Gaelic *kuig* (five) and Latin *quinque*. It is replaced by *p* or later by *f* in Welsh, Greek, and Teutonic (*pump*, *pente*, *funf*). Now in the Assyrian inscriptions we find reference to the Tochari, and these peoples (who lived in Bactria) are found to belong to the *k* tribes.⁵⁶ We can therefore show Tocharese as a dead *k* language in our diagram (Fig. 9) connected to the outer zone of Gaelic and Latin. Now Sanskrit uses the word *pañch* (five) as do the present-day Galcha tribes (Swat and Siah-Posh) of the Hindu Kush region. It also uses the later form of the word for hundred, i.e. *satem* for *kentum*. Lithuanian is in many ways close to Sanskrit, and its word is *penki* which is merely a form of *pañch*. If we use our "touchstone"—the cephalic index—we find that the Galcha lie on the isokeph of 83–85, the Lithuanians are about 83, and we may infer that the speakers of Sanskrit were of the same brachycephalic type. They were much later than the Gaels (76), Welsh (78), or Teutons (79).

The Indo-Aryan races may be subdivided first into the well-known *kentum* and *satem* groups and then as in Table VII.

If this table is accepted—and it seems to agree both with modern philology and with the migration-zone theory—then several important results follow.

⁵⁴ G. Sergi: *The Mediterranean Race: A Study of the Origin of European Peoples*, London, 1901, pp. 288–305.

⁵⁵ Except perhaps portions of T. G. Tucker's invaluable "Introduction to the Natural History of Language" (London, 1908), which I have used considerably in contrasting the structure of languages.

⁵⁶ See *Encyclopaedia Britannica*, 11th edit., Cambridge, 1910, Vol. 14, p. 495.

It shows that there was an enormous transgression in Neolithic times, whereby a very advanced language spoken by Alpine peoples was brought right across the center of Europe. They had a less powerful organization than the Etruscan and Mycenaean civilizations so that the peoples of the latter (helped by some Alpine blood) dominated, and their primitive *kentum* languages prevailed. But, when the Roman Empire gradually absorbed the Dacians, the Wends, the Swabians, the Belgae, and the Alpine Kelts, it did not impose Latin upon these peoples (as every classical

TABLE VII—RELATION OF CEPHALIC INDEX AND LINGUISTIC STRUCTURE

GROUP		CEPHALIC INDEX	LANGUAGE	FIVE	HUNDRED
<i>Kentum</i> languages	{ <i>k</i> languages (v. five, etc.)	76?	(Tocharese)	?	?
		76	Gaelic	Kuig	Keud
		77	(Latin)	Quinq	Kentum
	{ <i>p</i> languages (v. five, etc.)	78?	(Oscan)	?	?
		78	Welsh	Pump	Kant
		78	Teuton	Fimf-Pimp	Hund
		79	Greek	Pente	(He) katon
	{ <i>Satem</i> languages	Early Alpine	80	Panch	Sito
			81	Pietz	
		Later Alpine	82	Penke	Szimta Satem
			83?	Panch	
			84	Panch	
			85	Pese	

history seems to infer).⁵⁷ These barbarians had much higher languages of their own and very sensibly stuck to them. Their languages, for reasons stated, differed very little from Sanskrit, so that they readily adopted some of the Latin speech and syntax. It is most suggestive that the five languages which postfix the article are Lithuanian (82), Rumanian (82), Bulgarian (82), Albanian (83-85), and Old Norse. In the latter a small outlier of index 83 occurs (see map Fig. 6).⁵⁸

In no other way can one account for the fact that the European Alpine peoples, though ethnologically homogeneous, have so readily taken to French or German or Italian or Rumanian or Slav. They all originally spoke something akin to Albanian or Ladin, a sort of improved Aryan tongue (like Sanskrit), to which Latin, Teuton, and Slav were slowly evolving. They met the lowland invader halfway, as it were.

⁵⁷ Tucker (*op. cit.*, p. 241) is much more frank and writes "We can only guess at the original language of stock B" [i.e. Neolithic Alpines (83-88)].

⁵⁸ Linguistic data from B. G. Latham: *Elements of Comparative Philology*, London, 1862, p. 625.

This may help to explain why all the cumbrous suffixes of Latin vanished so rapidly, while the roots (common to Latin and Alpine tongues) passed almost unchanged into the Romance languages. I am unable to find many data regarding the type Alpine languages in Europe (Ladin and Albanian), but Albanian is always classed as a *satem* speech (see Table VII).

The real connection between ethnology and language has, I trust, been brought out as regards the great Aryan group of languages. This is not the place to discuss phonetics, but I have no doubt that Grimm's law of phonetic change will be found to be related in no small degree to the climatic changes to which the tribes were subjected. These climatic changes were not only those inherent on their wanderings but were also secular and affected stationary peoples as well. In the 100,000 years occupied in the variation of the Aryan languages there were, in my opinion, four considerable secular changes of climate; and the tribes themselves marched from arid Central Asia to cold wet Norway, so that the climatic stimulus varied greatly and was undoubtedly very important. I hope to develop this in a later paper.

Space does not permit of adequate treatment of the other great linguistic families, the Negro, Bantu, Dravidian, Hamitic, Melanesian, Iberian, Semitic, Malayo-Polynesian, Ugrian, Tungus, and Chinese, not to mention the horribly complicated tangle in North and South America. But it seems logical to me that the principles I have applied to the Aryan group cannot fail to help comparative philology in other continents. I propose to summarize the evidence which I have collected in the hope that later the problems may be undertaken in detail.

Table VIII shows in a highly generalized fashion some of the main concepts in this paper. The cephalic index is correlated with the languages and customs of type races in the four continents. The customs have been correlated previously, but the languages, especially of America, are merely inserted to help further study. I feel sure that some such seriation is legitimate, but the evidence to date is admittedly slender.

THE MOST PRIMITIVE LANGUAGES

We may rapidly run through the series of languages in the region between South Africa and China. The most primitive languages are probably those of the Sudanese Negroes, allied to Wolof, etc. This group extends across Africa to Abyssinia, where there is a typical shatter belt of all sorts of languages. The languages are not capable of expressing delicate shades of meaning, and there are no genders, etc. Curiously enough their very primitiveness makes them in some ways resemble Chinese, English, and other highly evolved languages. In former German East Africa the Mbugu are a Sudanese group, where primitive inflection is just beginning to approximate the language to Bantu.⁵⁹

⁵⁹ Alice Werner, transl.: *An Introduction to the Study of African Languages*, by Carl Meinhof, London, 1915

TABLE VIII—EVOLUTION OF CULTURE AND LANGUAGE (TENTATIVE CORRELATION)

GROUP	MIGRATION ZONE AND CEPHALIC INDEX	LANGUAGE TYPE	TYPICAL CUSTOMS, FOLKLORE, ETC.	AFRICA, EUROPE	ASIA	AMERICA (SUGGESTED ONLY)	AUSTRA-LASIA
I	Negro (70-72)	Jejune; often reduplicating; absence of gender; few numerals	Fetishism	Sudan and Guinea tribes Mbugu			Papuan
II	Mousterian (72-74)	Very complex prefixes and suffixes; much alliteration	Fetishism matriarchy; group marriage; boomerang; totemism	Bantu	Nair, etc.	Botocudo?	Australian New Hebridesan
III	Hamitic (74-75)	Polysynthesis common; and more regular synthesis	Couvade; totemism; serpent cult	Masai Fulah Basque	Dravidian	Eskimo Iroquois	Dentrecasteaux
	Semitic (75-76)	Trilaterals	Couvade; serpent cult	Coptic Tigrina	Arabic Hebrew (Kanarese)	(Algonquian)	South Solomon
IV	Early Aryan (76-78)	Highly synthetic (<i>ken-tum</i> in west of Eurasia)	Monoliths; Gaelic belt; tattooing; levirate	Gaelic } Latin } Greek } Teu- } ton }	Igorot Japanese Korean	Algonquian Arawak Athapascan	Malay S. E. Papuan Maori
	Late Aryan (78-80)	Highly synthetic to analytic (<i>sa-tem</i> in west of Eurasia)	Unforked kin words; levirate; shamans; swan-maiden myths	Slavonic	Persian Galcha	Carib Tlingit Haida	Louisiade E. Solomons
	Early Alpine (80-85)	Vowel harmony; clear suffixes to root; losing inflections	Forked kin words; head deformation; shamans	Magyar Serb Czech	Finn Tungus	Shoshone Aztec? Sioux?	Hawaiian Samoan Tahitian
	Late Alpine and Mongolian (85-88)	Tending to positional; monosyllabic	Early triumph of art and social law	Albanian	Kirghiz Chinese	Quichua?	

The Groups I-IV are related to the Four Great Ice Ages.

THE "MOUSTERIAN" LANGUAGES

The next great family may be called the Mousterian. It includes the Bantu, a few low tribes in India (Nair?), and the Australian. By this time inflection is in full swing. In Bantu (74) prefixing usually prevails, and we shall note a gradual change as we ascend the scale. Thus in Semitic (76) we find prefixing and postfixing about equally developed. In Aryan

(79) inflections are mostly postfixed. In Ural Altaic (83) the affixes are always postfixed.⁶⁰ Australian is higher in type, for many tribes have three numbers (including dual). The inflections are usually suffixed and are extremely numerous and complicated. Thus the noun expresses time also. Genders are not usually shown by inflection.⁶¹ I have no data of the cognate Indian tribes.

HAMITIC AND IBERIAN LANGUAGES

The next zone includes the Hamitic tribes, who are well represented in the Sudan, in the Deccan, and probably along the eastern coast of America. They have developed along somewhat different lines in these three widely separated regions. In Africa the most primitive type is the Hottentot Nama, who is an "outlier" of relatively high head index (75) amid lower Bantu. It preserves the primitive dual number, like the Bantu, but has the general character of the Hamitic tribes. These have full inflections for number and gender. The feminine (or weaker) gender is marked by *t*, which also characterizes many Semitic languages. There is no doubt now that Semitic has been derived from Hamitic.

Basque is spoken by a very mixed set of peoples in the Pyrenees. The majority have a head index about 79, but a few Cevenole (84) villages are also included. The language seems to be more nearly allied to Berber (Hamitic, 76) than to any other, and the nucleus of the Basque country has folk of this head index. Is it possible that we have an isolated Etruscan colony here, like the corresponding one in Nigeria, which once dominated a much larger region? The Basque language is therefore a fine example of a retrogression in that the speech of a lower race has conquered that of a higher. We get the same thing in the interior of Victoria, where you may hear a veritable pure-blood Chinaman asking for his "pyper" (i.e. newspaper) in typical Australian vernacular! Basque is of course the sole European language (with possible exception in the Caucasus) which incorporates the object in the verb. This is very characteristic of the American languages. Basque takes in the direct pronominal object (and French has a touch of this also). Iroquois can also incorporate the noun object in the verb and "has nothing in common with the structure of the Algonquian or Sioux languages"⁶² adjoining. This can only mean that it belongs to a different migration zone, as I postulated from the head form (76 or so) in my previous paper. No error has been so widely promulgated as that all American languages are polysynthetic and incorporating. The best-known tribes were the eastern *primitive* tribes, just as in Eurasia the best-known were the western *primitive* tribes. One incorrect, if natural, result of this has been to place the Teutonic speech on a pinnacle which it by no

⁶⁰ Henry Sweet: *The History of Language*, London and New York, 1900. The figures are cephalic indices, which I have added.

⁶¹ Roth: *West Queensland Aborigines*, 1897. (Pitta Pitta tribe.)

⁶² Franz Boas: *Anthropology of Canada*, 1910, p. 530.

means deserves and to degrade the Amerind languages to the level of the (Hamitic) Iroquois, which is almost the lowest in the continent! Such are some of the results of the neglect of a geographical treatment of linguistics.

SEMITIC LANGUAGES AND THEIR RELATION WITH ARYAN

The next great group which we meet in our traverse is the Semitic. This is best known from Hebrew and Arabic. It is somewhat sharply

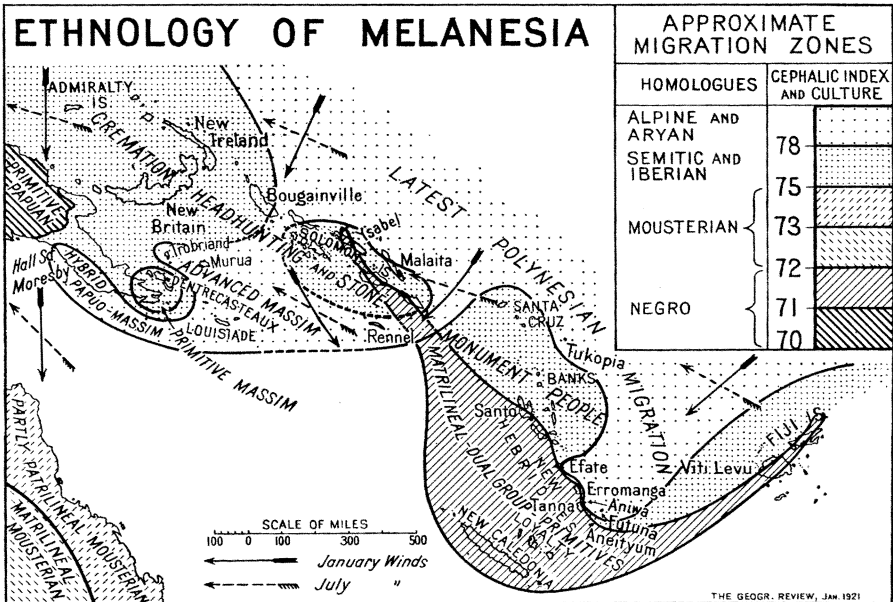


FIG. 10—Map showing the ethnology of Melanesia (based in part on Rivers, Seligman, and Codrington). The migration zones merge somewhat, especially in the north. The Polynesian migration from the east has cut across the earlier Iberian and Negro migrations.

marked off by the trilateral words which build up much of the language. Thus *falat* (bend) is changed into *filat*, *fulatu*, *valu*, etc., much as we add inflections. Macdonald has shown that this scheme is quite usual in languages of Melanesia,⁶³ in fact just where the Black Jews mentioned previously are found. He shows also many similar roots connecting Efatese (Melanesian) with Arabic and Malay and of course also with Polynesian.

I have no doubt whatever that the clue to the connection between Hamitic, Semitic, Aryan, and Alpine languages will be found in the numberless dialects extending from Aneiteum (New Hebrides) to New Britain and to Samoa. Here each group of islands is occupied by a wave in the migration zone, and we can trace the evolution of head form from 74 to 83 and the corresponding change in language more clearly than anywhere else in the world.

⁶³ D. Macdonald: *The Oceanic Languages*, London, 1907.

Macdonald believes that the Melanesians came straight from Arabia, but they are of course primitive tribes pushed out of Burma and Malaysia by the great Aryan and Mongolian migrations. The Tagala language in the Philippines has Semitic affinities, e.g. it modifies a word even more peculiarly than does the Semitic ablaut. Thus the trilateral *sulat* becomes *s (in) ulat (an)*.

Judging by analogy some of the Algonquian tribes should show Semitic features. No doubt the old stories of the Lost Ten Tribes and of Hebrew words in America will have some slight foundation in this respect. If the Haida-Tlingit (80) group has affinities with Melanesian, as Boas suggests, it is most probably with the northern Melanesians, who have a head index about 79 (e.g. in New Britain), and not with the Black Jews of the Solomons.

The connection between Semitic and Aryan in the Eurasian region is very vague, probably because the Assyrian and allied dialects were highly altered from their primitive condition. No doubt primitive Semitic dialects (perhaps from Abyssinia) will show a relation to primitive Aryan, e.g. Gaelic or some Deccan dialects.

ARYAN LANGUAGES OUTSIDE EUROPE

The Aryan group has been treated fairly fully for the European section. The connection with the lower Indian dialects (e.g. Kanarese, 76) is quite readily distinguished. I have no doubt that the Lolo peoples (who wear garments like those of the Bretons and other primitive Aryans) speak an Aryan language.⁶⁴ There are many features in Maori (79)⁶⁵ which remind one of modern English, for instance the articles, the uninflected noun, the feeble development of gender, the prepositions, and their relation to article and noun. Other features however are unlike. Japanese to some extent seems of a primitive Aryan type. It has independent pronouns but with clumsy forms still showing their origin (e.g. "I" is translated by an abbreviation of "selfishness"). It has noun suffixes, which are however to some extent separable and show their etymology also. It is of course not even remotely connected with Chinese (though it derives hundreds of words from the latter) but has many affinities with Malay and Polynesian.⁶⁶

In North America many of the Plains Indians speak languages remotely resembling Aryan, e.g. Pawnee (85) bears resemblances to Sanskrit (83). Athapaskan (83-78) does not incorporate readily, and the object is independent. It is most interesting to note how the small units on the western coast (in the shatter belt) agree with the less disturbed tribes on the other side of the Great Corridor. Thus we may compare the sections using

⁶⁴ Described as monosyllabic. See A. F. Legendre: *Far West Chinois, T'Oung Pao*, Series 2, Vol. 10, 1909, pp. 340-380, 399-444, 603-665; reference on p. 635.—EDIT. NOTE.

⁶⁵ The lower Polynesians resemble the Greeks and Persians in their substitution of H and S. Grimm's Law connecting P and B, T and D also holds for Polynesians as for Germans (Tucker, *op. cit.*, p. 237).

⁶⁶ "Polynesian could never be classed as agglutinative, inasmuch as it expresses grammatical relations by free particles after the manner of the most advanced analytical tongues such as English" (Tucker, *op. cit.*, p. 141).

Athapascan speech—two small groups on the western coast and two much larger groups on the eastern side of the (later) Shoshone and Navajo nations. Salishan Chinook are probably not far removed in kin from some Athapascan tribes; but there has been a great transgression of the Athapascan dialect, as I have suggested earlier, and details are too few for me to do more than suggest their ethnic and linguistic affinities (see Fig. 2).

As regards the Alpine and Mongolian peoples we may consider for a moment their distribution in Asia. The Alpine folk of the southwest, Galchas, Armenians, etc., were undoubtedly once in contact with the great Alpine group of central Europe. They spoke an Aryan tongue. But the tribes to the northeast of these, e.g. the Kirghiz, Yakuts, etc., though of somewhat the same head form, were presumably isolated from the Galchas, etc., by the marshes and deserts of the country about the Aral sea. Hence their languages are not particularly similar; though as usual the most primitive representative, Finnish (81-83), is readily compared with Slavonic (81-83).

The Finns, Magyars, Turks, and Tatars entered Europe from the northeast, the other European Alpine peoples came from the southeast; hence the distinction (see Fig. I, Pl. I). The isolated position of the Yenisei Ostyaks has often been remarked. Their language is akin to none near by, nor is their head shape (76). Probably Ainu is a congener.

The great group of Paleo-Siberian folk in the northeast of Siberia (Chukchi, Koryak, Yukaghir, 82) have been found to agree linguistically very closely with the similar zone in Alaska and Canada. I do not see why it is necessary to assume that the Yukaghir originated in America, as some ethnologists aver. This would be contrary to all the other evidence of migrations. For the same reason we must assume that the Eskimos are of Asiatic and not European origin. The pure tribes are, as always, found furthest from Asia, i.e. in Greenland. Here they are shorter and less Mongolian, in fact true Aurignacians. The Western Eskimos are obviously a mixed people.

It does not seem to be realized by Americans how diverse are the various Melanesian peoples. (The writer no doubt makes similar false analogies with regard to Amerinds.) For instance the Salishan speech is described as more like Oceanic than Algonquian. I can quite believe it, but "Oceanic" ranges from "Hamitic" up to "Alpine." Furthermore, some of the old analogies, which are almost forgotten today, seem well worthy of revision. Thus Petitot compares Algonquian with Celtic, Mendoza relates Nahuatl to Aryan, and Hamy says Otomi is isolating and monosyllabic like Chinese.⁶⁷ In many respects these seem to the writer very logical comparisons, though he cannot refer to the original papers.

⁶⁷ Quoted by A. F. Chamberlain: The Problems of the Unity or Plurality and the Probable Place of Origin of the American Aborigines: The Problem from the Standpoint of Linguistics, *Amer. Anthropologist*, Vol. 14, (N. S.), 1912, pp. 50-57. [It should be stated that Chamberlain regards all such comparisons as "unjustifiable."]

As regards South America, I cannot get any data of value. There is little doubt of a general evolution from the Ges speech of the Botocudo (74) up to the concise highly-developed speech of the Araucanian (86).⁶⁸ The same phenomena of corridors, shatter belts, outliers, inliers, and transgressions are obvious, but it is not possible for an Australian to cope with them. One main reason is because the Americans seem to have abandoned the cephalic index as one of the mainstays of ethnology; and even Wissler's most valuable textbook gives very few coefficients beyond those I have used so continuously from Deniker. I trust that this paper, if it does nothing else, will show how helpful is this old-fashioned criterion and will lead to renewed activity in measuring the aboriginals who are everywhere vanishing before the so-called "white civilization."

One last word as to the highest type of speech. Ethnic data are wanting for Central Asia. The Chinese of the coasts are put down at about 85, but the purest and last developed Chinese will be found in the northwest. Here it is quite probable that they rise to 88. Thus we have two groups of peoples, the Alpines and the Neo-Chinese, included within the 86 iscephalic line. They have never mingled to any degree, for the topographic conditions have been adverse. Bleak steppes to the north, a huge arid plateau in the center, and the Himalayas to the south have kept them independent for 50,000 years, except perhaps for some contact in Persia and the Tarim region. The Alpine folk have never produced a purely Alpine civilization, though the whole of European progress since the Achean invasion of B. C. 1000 has been leavened by their sterling virtues. But, owing to a variety of factors, Etruscan civilization (76) has been followed by Roman (76-77), and this by Spanish (77) and British (78). The Carolingian and Hapsburg dominations were, I suppose, Alpine. Possibly the whole matter turns on command of the sea, for the European Alpines have never been coastal peoples except in Dalmatia. Today the most highly evolved crania of the West belong to the Swiss and the Albanians. Who shall say how far they might go, should militarism be scotched and the small nations be able to give themselves freely to the arts?

CHINESE COMPARED WITH MODERN ENGLISH

Of the Chinese I have written much already. Their language was undoubtedly a thousand years ahead of any other at the dawn of history. Why has it not progressed? I am inclined to think that this is due chiefly to two factors. Their philosophy was eminently conservative, so that everything must be sanctioned by custom. This method of everlastingly "looking backward" for precept and guidance kills all progress. Moreover they were remarkably free from competition with any other nation. No doubt they were often at war but always with barbarians. They lived in a sort of

⁶⁸ The same structure of the verb is found in Araucanian and Turkish (Tucker, *op. cit.*, p. 87). It is significant that these races are on the same isokeph (84-86), and probably both originated in southern Siberia about the same time.

"Yellow China," and all history shows that nothing can be so harmful to a nation, if this policy be carried too far.

Modern Chinese, like modern English, consists largely of "small square strong root words" far superior to the inconvenient flexion-encumbered Indo-Germanic sentence word.⁶⁹ It has an abundance of auxiliary words just as we have in English. It makes great use of *position* as a clue to the meaning of a sentence and in fact uses much the same word order as we do. There are practically no inflections.

If we study outlying allied languages such as Tibetan we can trace the development of Chinese from something akin to Manchu to its present form. It is false to say that Chinese is one of the most primitive and jejune of languages. Possibly it is not very flexible, but I am inclined to believe that the spoken language is superior to the written in this respect. If the Chinese people could only drop the archaic pictographs, or ideographs, of which 3,000 must be remembered (in place of our 26 letters) I can imagine that Chinese would take rank with English as a world language. It is indeed gratifying that the English speech has developed within a short 1,500 years from the archaic Anglo-Saxon to one of the best means of expression. Let us pray for the time when the orthography shall be worthy of such a noble language so that the spelling may be fitted to the spoken word and not preserved merely to simplify the labors of etymologists!

Conclusion

If my views are correct, it is obvious that many current opinions with regard to the mixing of nations are not supported by ethnology. It is most unfortunate that the half-caste problem has aroused most attention in the United States and in India, and that all our ideas are inevitably colored by results in those regions. The African Negro is the least evolved of the races of man, and ethnically the white negro half-caste is lower than the white. Possibly there may be something in the idea that the cranial sutures close too soon in the case of the Negro to admit of full expansion of the brain. In most of India the tribes are of a lower ethnic type than the European. Even in the north the so-called Aryan tribes are largely pre-Aryan (below 76), though with the Aryan speech. Hence here also the Eurasian may very well be below the white standard, unless the most advanced Indians are involved. I am disposed to think, however, that in many cases the ethnic deterioration is too slight to be important and that racial antipathy rather than racial degeneration is largely to blame for the troubles of the Eurasians.

As regards the Alpine, Mongolian, and most Amerind and Polynesian peoples the future seems to me to be most promising. It is our diseases and our vices, especially the use of alcohol, which constitute the so-called "overpowering effect of the white civilization" upon the uncivilized nations.

⁶⁹ J. O. H. Jespersen: *Progress in Language*, New York, 1894, p. 127. See also Tucker, *op. cit.*, p. 125.

When they are protected from these evils, and when public opinion is educated to regard them as our ethnic equals instead of as our inferiors, we may hope to see them thriving equally with the European nations. In South America, as Bryce has pointed out, the *mestizo* is quite equal to the pure Spanish peasant. He may well be so, for the Spanish Iberian is in many cases raised in the ethnic scale by the mixture with Aryan or Alpine blood which fills the veins of so many Amerinds. The same results may be expected with regard to most Mongolians, with the possible exception of the southeastern tribes of Asia, where, it may be, there is a large proportion of lower Aurignacian stock.

Appendix

The Climatic Cycles

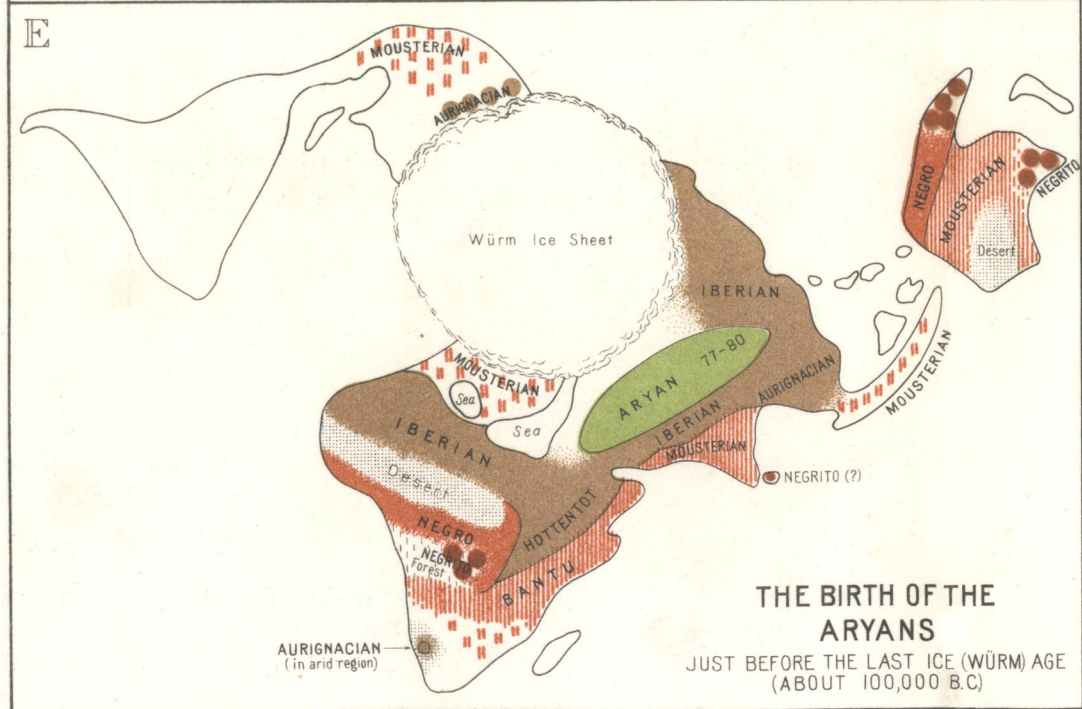
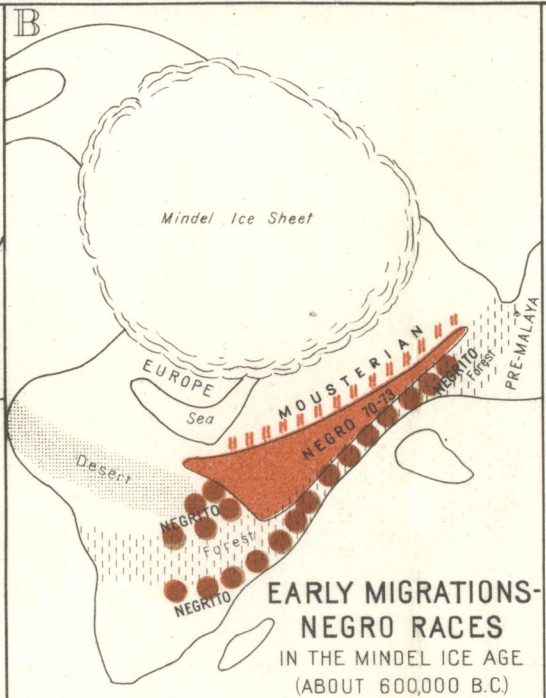
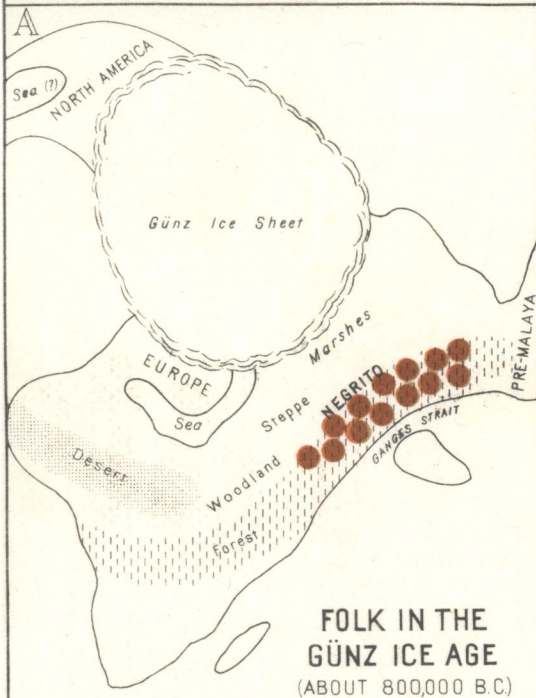
In my former paper I expressed my belief that the Ice Ages occurred at intervals of about 200,000 years, and I suggested as possible causes planetary or stellar disturbance. Only recently have I learnt that G. H. Darwin had suggested a cycle of 200,000 years on the variations of the orbit of the earth.⁷⁰ Croll's similar work did not appeal to me, for his cycles recurred every 21,000 years, which is certainly not the case with the Ice Ages. It is, however, quite possible that his short cycles accounted for minor migrations.

If now the shape of the earth's orbit changes from nearly circular to relatively elliptical, we shall get the change from *uniform* climates to *zonal* climates which I described fully before. This change in orbit is, I understand, supposed to be largely due to Venus and other planets in our solar system; and Darwin's suggestion certainly encourages me to believe that some such agency is operative in determining my minor cycles. Why, however, do not the Ice Ages recur *every* 200,000 years? Why does the earth enjoy a uniform climate for nearly 100,000,000 years before the next set of Ice Ages as postulated in my *major* cycles?

It seems probable that at each *major cycle* the earth is subjected to two different forces. (1) The orbit becomes very elliptical with the results given above. (2) The earth's crust is subjected to great strains so that buckling and cracking occur and the mountain systems are redeveloped from old penepains. We know that precession is due to a differential pull by the moon and sun on the equatorial bulge. Is it not possible that some unknown stellar body can affect our solar system each 100,000,000 years so as to cause much greater strains on the crust at the earth's equatorial bulge? I am aware that it seems difficult to imagine the earth being so affected without considerable derangement of the planetary orbits. Since, however, the earth can change its orbit, as astronomers admit, this may not be an insuperable objection.

⁷⁰ Cited in H. G. Wells: *The Outline of History*, 2 vols., London and New York, 1920; reference in Vol. 1, p. 20. I have not been able to verify the original statement.

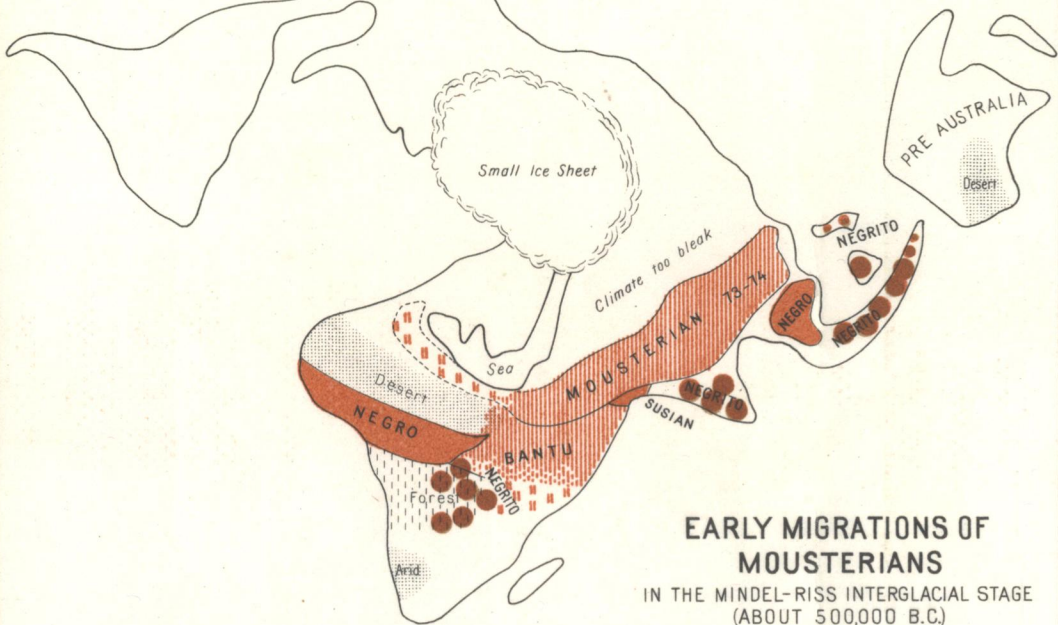
MAIN STAGES



MIGRATION ZONES: ■ NEGRO ■ NEGRO ■ MOUSTERIAN AND BANTU ■ IBERIAN (INCLUDING AURIGNACIAN)

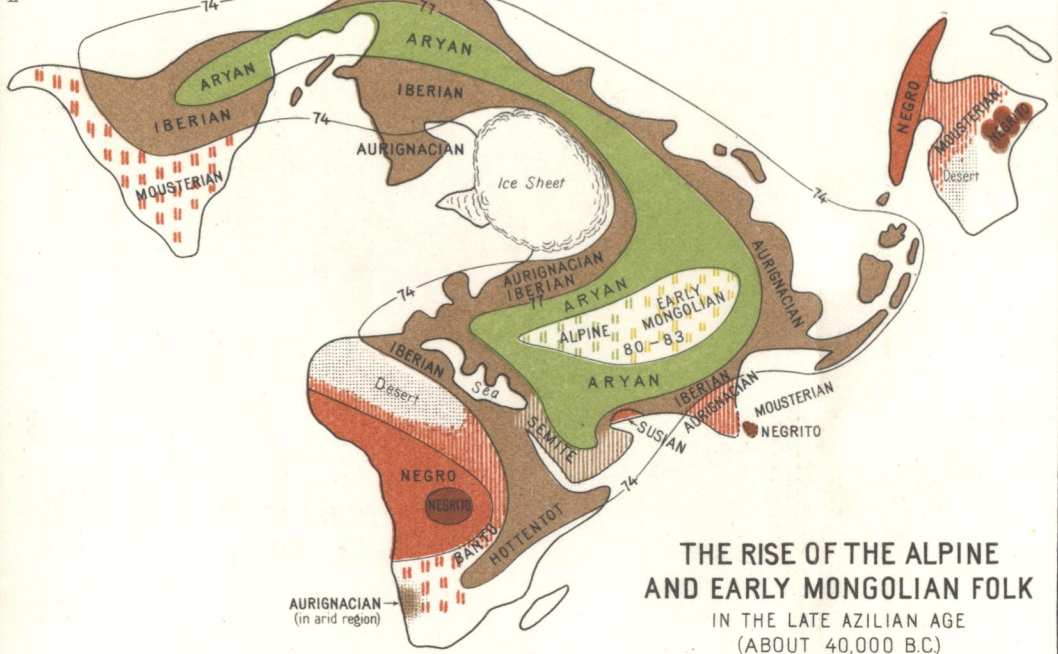
IN STAGES IN THE POPULATING OF THE WORLD

C



D

F



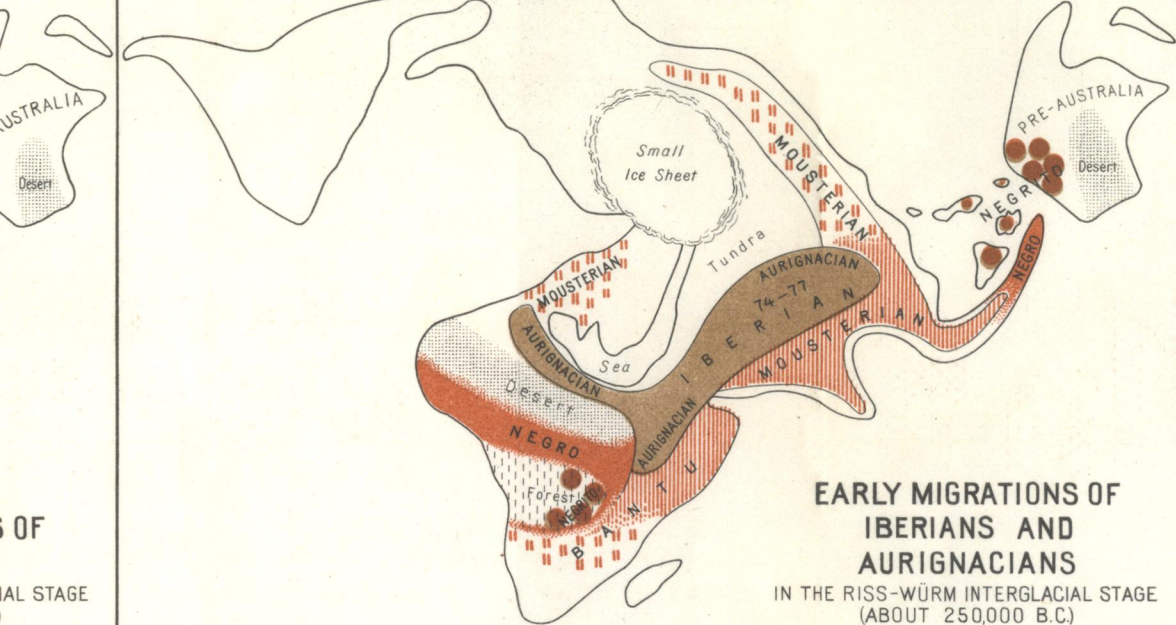
G

IBERIAN (INCLUDING AURIGNACIAN AND HAMITIC) SEMITIC EARLY ARYAN LATE ARYAN (EUROPEAN ALPINE AND SLAV) ASIATIC AL

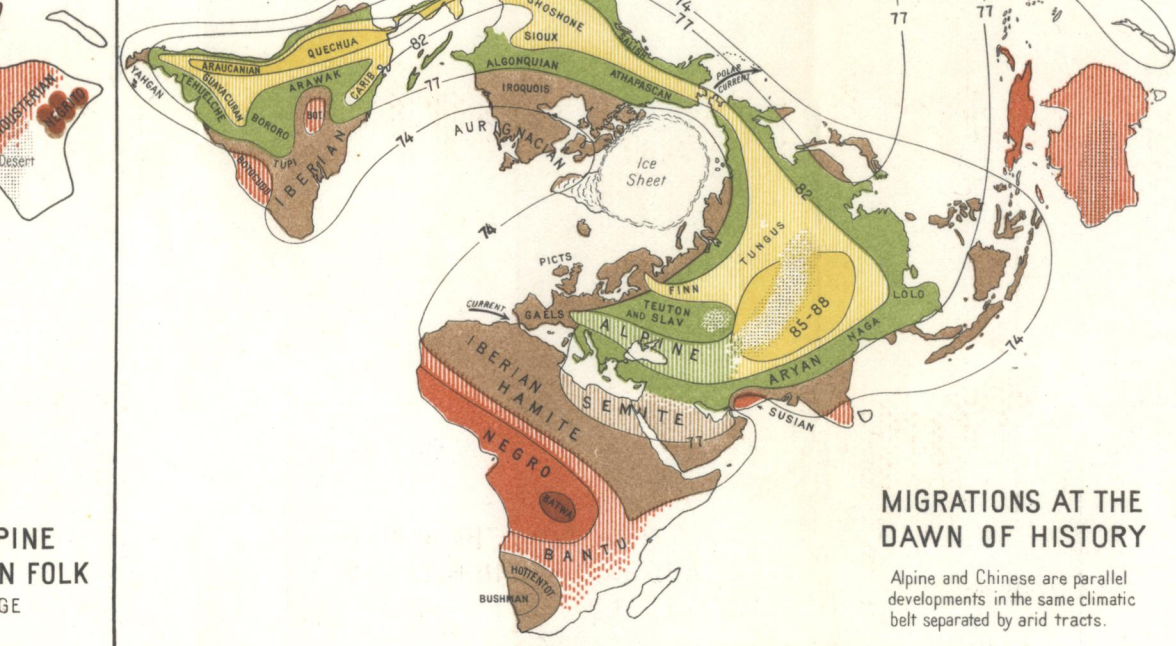
PRINCIPAL BARRIERS: Forest Desert

THE WORLD

D

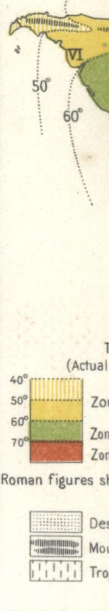


G



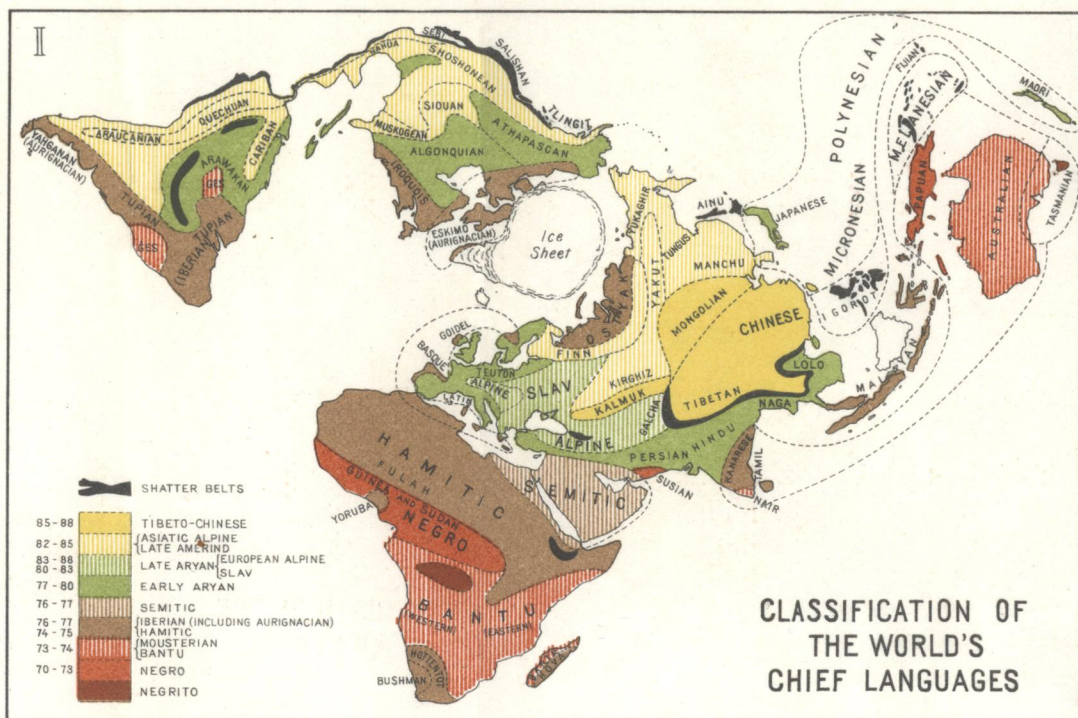
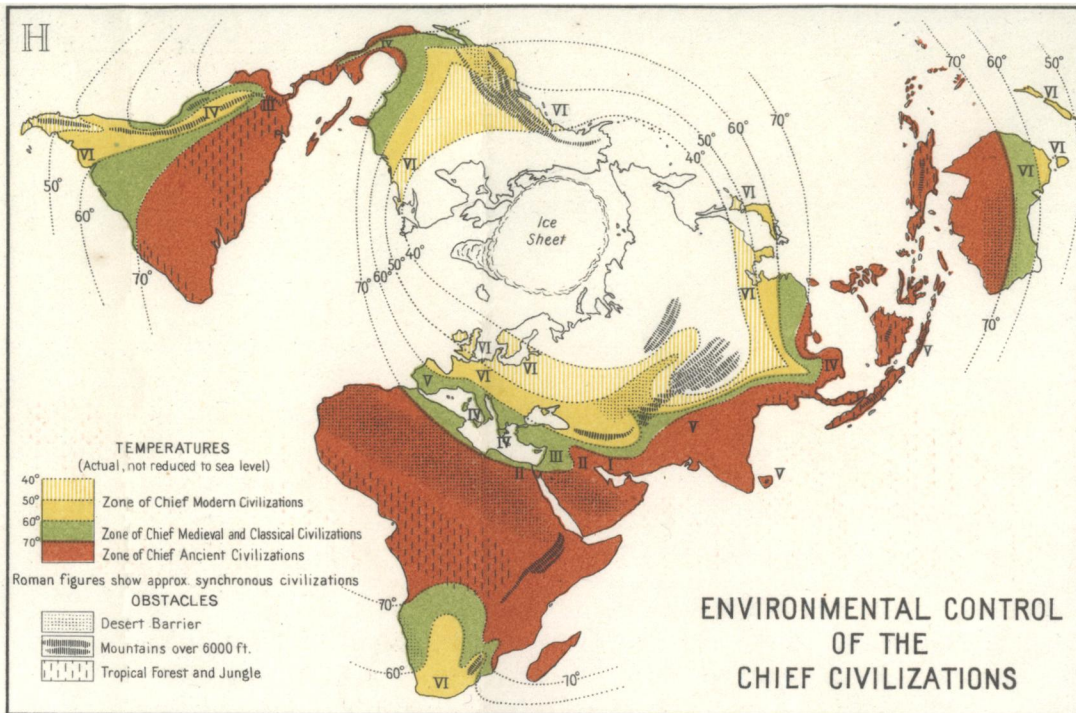
ASIATIC ALPINE AND LATE AMERIND TIBETO-CHINESE — Numbers refer to the Cephalic Index

H



I





Finally, I should like to draw attention to the interesting diagrams in Huntington's "World Power and Evolution." Here (in Chapter VII) a cycle of climatic changes (cold wet, dry arid, warm moist) has been graphed. This is the same as I had deduced by another method, quite independently, though at a later date.

Summary

1. Attention is drawn to the value of the cephalic index as corroborated by the research of Macalister and Venn. Both the infantile and primitive skulls are relatively long (dolichocephalic), and in both there is a gradual change (racial and individual) towards brachycephaly.

2. The relation of color to head form and temperature is investigated. The sequence yellow, olive-brown, dark brown, chocolate occurs fairly regularly in zones around Tibet.

3. The present is an age of great geological evolution. Evidence based on the chief earthquake zones and on the distribution of terrigenous deposits in the Pacific shows that the coastal plains around the latter have sunk during the Pleistocene and so destroyed many of the chief migration corridors.

4. Data as to the Negrito seem to show that nowhere is the pure type preserved. The more primitive Negritos are progressively more dolichocephalic.

5. Seven charts are given showing the migrations of the various races from Asia during the Four Ice Ages and Interglacials. Thus in the Mindel Age, Negrito, Negro and Mousterian are migrating. In the Riss-Würm Interglacial the Iberians are developing in Asia, and in the Würm age the Aryans. The Azilian is marked by tremendous hordes of Iberians and Aryans entering America. The corridors of Gibraltar and Bering broke through about this time. The last chart shows conditions much as they were before the great modern migrations of European races to other continents.

6. Certain regions containing débris of many diverse tribes are called "shatter belts." They occur along the outside of the main corridor from Asia to America, in the Caucasus, in Abyssinia, and in Brazil. Their relations to the less disturbed tribes on the opposite side of the corridor are discussed.

7. The evolution of culture is dealt with in each zone. The curious parallelism of race distribution in Africa and in Australasia indicates that the peoples must have originated to the north of, and midway between, the two continents (i.e. in Central Asia).

8. The Mousterian culture, including totemism, the bull-roarer and the boomerang, is characteristic of the most primitive zone with head index 72-74. Similarly the Hamitic zone (74-76) is sharply defined as the couvade horizon in ethnology. The serpent and sun cults are of this zone also.

9. Reasons are given for allying the Semitic peoples with the earlier Hamitic races rather than with the succeeding Aryan races. Linguistic studies support this theory.

10. The Nordic races at the base of the Aryan (76-77) are marked by the monolithic monuments, and by the custom of tattooing. The Gaelic belt is well defined from Scotland to the New Hebrides. The folklore (such as the deluge and swan-maiden stories) forms a well-marked horizon.

11. The racial components of the European nations are tabulated. The French, Italian, and Grecian nations are shown to be as diversely constituted as the lately dismembered Austrian Empire.

12. Some success is obtained in disentangling the invasions of Europe by brachycephalic Alpines in Neolithic times. These preceded many dolichocephalic Teutons and all the Slavs, though these latter had originated first in the Turkestan region.

13. Levirate, head deformation, marriage by capture or purchase are discussed as regards "zoning" of the later Alpine and Mongolian races. The high status of the Chinese at the dawn of history is described, but it seems possible that the southern Chinese have incorporated many early Aurignacian tribes.

14. The rise of the various great civilizations is discussed in terms of environment and head form. The former is shown to be the controlling factor, and race has little to do with it provided the cephalic index be above 76. In almost all cases there has been a marked climatic deterioration in the regions famed for ancient civilizations. On the whole, races of medium head form have become dominant. The belts of civilization, like the isotherms, have moved poleward during the historic period.

15. If the languages comprised in a family be examined it will be found that the most primitive is spoken by tribes with the lowest head form, whose habitat in general is farthest from Central Asia. Thus Gaelic (76) and Latin (77) are more primitive than Welsh (77) or Teutonic (78) or Greek (78). All these are less evolved than Slav (81), Lithuanian (82), or Sanskrit. (Cephalic indices slightly smoothed.)

16. Many languages are preserved in three forms: fossil (like Sanskrit), highland "inliers" (like Galcha) or migrant (like Lithuanian). These concepts are described in terms used in geology, e.g. outliers, inliers, transgressions, shatter belts, etc., with considerable advantage.

17. The evolution of the various languages is graphically depicted like a series of lava flows emanating successively from a common center (Turkestan, etc.). Thus Bantu precedes and is thrust away by Hamitic, which is displaced in turn by Semitic (and then follow Aryan, Alpine, etc.).

18. The classification of the Indo-Aryan languages into *kentum* and *satem* and *k* and *p* forms is correlated with head forms and with the migrations. It seems evident that Sanskrit was developed long after the Latin and Greek tribes had left Asia.

19. The Neolithic Alpines spoke a more advanced language than the

Romans or Greeks. It was akin to Sanskrit, and the Romance languages are not developed from Latin but are merely Alpine tongues slightly modified by the Roman speech.

20. The Semitic tongues are akin in structure and vocabulary to the Melanesian languages. It seems probable that the linguistic links joining Hamitic to Semitic (and so to Aryan and to Alpine) can be more profitably studied in Melanesia than in the Mediterranean region, where the races are more intermingled.

21. Little comparative philology has been done on the Amerind languages, but it seems clear that they progress regularly from Iroquois through Algonquian and Athapascan to Shoshonean and Siouan. In the southern continent there is a parallel progression from Ges through Tupian, Cainguan, Arawakan, and Cariban up to Araucanian. This is, however, merely a suggestion based on the sequence found in other continents.

22. The writer can see no good reason for believing that the Paleo-Siberians (Chukchi, Yukaghir, etc.) evolved in America. The similarity of their languages with Amerind speech is in keeping with the analogous agreements found all over the world. But the migrations were the other way, from Asia to America. The same argument applies to the Eskimos who also moved from west to east.

23. The latest developments in speech and race occurred among the Alpines and late Mongolians. These are parallel variants of the same zone (83-88) who have remained fairly distinct because there has been a great physiographic barrier between them during the last 20,000 years or so.

24. The Chinese language, so far from being primitive, in many ways shows the type to which English (with its strong abbreviative and amalgamating tendency) is unconsciously evolving. Research on kindred dialects shows that Chinese had passed through the synthetic stage before the dawn of history. The development of early Turanian from late Aryan can be made out in northern India. Here again the Chinese come out near the apex of human evolution. Their only ethnic rivals are the Alpine folk extending from Savoy through Rhetia, Albania, etc., to Armenia and the Pamirs. These latter have not had so favorable an environment and so had not developed a high civilization before 3000 B. C. like the Chinese.

25. In an appendix some notes are added on the duration of the climatic cycles which cause the Ice Ages and which ultimately determined the major features of human evolution.